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Net zero aligned organizations

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

0.1 The need for climate action

The urgency of addressing climate change necessitates ambitious and science-based targets for greenhouse gas (GHG) emission reductions. Scientific assessments through the Intergovernmental Panel on Climate Change (IPCC) reported in the IPCC's Sixth Assessment Report [1] have shown that many of the worst consequences of climate change can be avoided by limiting global warming to 1,5°C above pre-industrial levels. The global temperature is already well over 1°C above pre-industrial levels, and scenarios assessed by the IPCC indicate that limiting warming to 1,5°C, with no or limited temperature overshoot, requires achieving at least net zero global anthropogenic carbon dioxide (CO_2) emissions in the early 2050s, along with deep and sustained global reductions in other GHG emissions. These scenarios also show that the earlier and faster GHG emission reductions occur, the lower peak warming and the lower the likelihood of overshooting warming limits. To limit the damage caused by climate change, following these pathways for deep, rapid and sustained reductions in GHGs only becomes more urgent if global temperature increase breaches the 1,5°C limit.

The 2015 Paris Agreement [2] recognizes that achieving the long term temperature goal will require reaching a global balance between anthropogenic GHG emissions and anthropogenic removals in the second half of the 21st century. This is to be achieved by countries committing to and delivering their Nationally Determined Contributions (NDCs), taking into account the principles of equity, common but differentiated responsibilities, and respective capabilities in different parts of the world, and in the context of sustainable development and the goal of eradicating poverty.

0.2 Net zero alignment for organizations

This document provides guiding principles and specifies requirements for organizations, aligned with the Paris Agreement [2] and the latest climate science, to establish ambitious and credible net zero pathways, that can be validated and verified, driving organizations to achieve organizational net zero as soon as possible. It emphasizes deep GHG emission reductions in the near term, while promoting a just and equitable transition. It is intended to be a common reference for all types of organizations taking action to contribute to global net zero, with additional guidance provided specifically for small and medium-sized enterprises (SMEs) in Annex A

Taking account of the Paris Agreement [2], this document also includes requirements and recommendations relating to the human dimensions of an equitable and just transition for organizations and communities affected by the actions needed to keep average global warming under 1,5°C.

This document covers reduction of direct and indirect GHG emissions within the value chain of the organization, including upstream and downstream processes, as well as counterbalancing of residual GHG emissions through carbon dioxide removal and storage, with priority given to action within the organization's GHG inventory boundary.

0.3 Alignment with other relevant standards

This document builds on progress by voluntary initiatives, other standard setters, international organizations, campaigns and governments. In so doing, it aims to provide a consistent approach for future interventions and deliverables, including ISO standards. It also supports the objectives of the “High-Level Expert Group on the Net Zero Emissions Commitments of Non-State Entities”, formed at the request of the United Nations (UN) Secretary General (see [3]UN Integrity Matters report), and aims to be aligned with initiatives for balancing global GHG emissions with GHG removals. This document was developed from the ISO Net Zero Guidelines IWA 42:2022 [4].

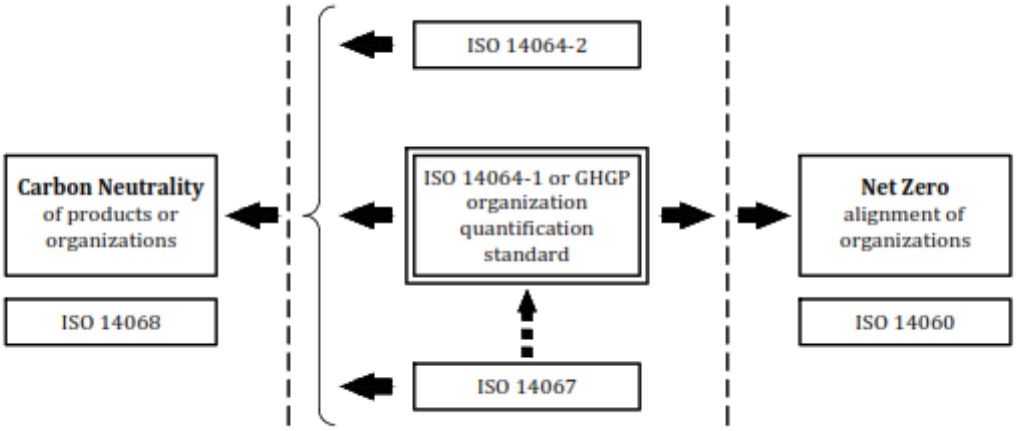
This document builds upon existing International Standards addressing GHG quantification, reporting, validation and verification, such as ISO 14064-1:2018, ISO 14064-2:2019 [5], ISO 14064-3:2019 [6] and ISO 14067:2018 [7] . This document establishes requirements for validation and verification, which may be undertaken on a first-, second- or third-party basis.

At the time of publication, important standards of relevance to this document are undergoing revision and alignment. ISO and the Greenhouse Gas Protocol (GHGP) have formed a partnership with the goal of combining

their existing portfolios of GHG quantification standards and co-developing harmonized co-branded international standards. This includes ISO 14064-1:2018, ISO 14064-2:2019 [5] and ISO/TS 14064-4:2025 [8], alongside the GHGP Corporate Accounting and Reporting Standard [9], the GHGP Scope 2 Guidance [10] and the GHGP Scope 3 Standard [11]. Pending publication of the revised and combined standards, references are made in this document to the current editions of both sets.

This document sets out an approach different to ISO 14068-1:2023 [12], which establishes an approach for organizations to use carbon credits to make claims of carbon neutrality during their transitions, based on offsetting their carbon footprints. An informative document explaining the roles of ISO 14060 and ISO 14068-1:2023 [12] is available at the TC207/SC 7 website.[1)]

NOTE Third party validation and verification can be required in some jurisdictions by legislation and can be a requirement of other GHG quantification and net zero standards and schemes. It is generally recognized that third party validation and verification deliver greater credibility and can be expected by stakeholders.



Black arrow Contribute to
Dashed arrow Applicable document
Double bordered box Normative to ISO 14060

Figure 1 — Illustration of the relationship of this document to other standards on greenhouse gas and climate change management developed by ISO committee TC 207/SC 7

This document is not a management systems standard, but many of its requirements can be addressed using the "Plan, Do, Check, Act" model, on which management systems standards, and the resultant management systems themselves, are based. For example, there are many parallels between the requirements in this document for leadership, transition planning and target-setting, net zero action, monitoring and improvement, and the equivalent clauses in management systems standards. Organizations with environmental and other management systems could use those system processes to manage many of the requirements of this document.

0.4 Use of this document

In this document, the following verbal forms are used:

— "shall" indicates a requirement;

— "should" indicates a recommendation;

— "may" indicates a permission;

— "can" indicates a possibility or a capability.

1) This will be provided prior to publication of this standard.

Information marked as “Note” is intended to assist the understanding or use of the document. “Notes to entry” used in Clause 3 provide additional information that supplements the terminological data and can contain provisions relating to the use of a term.

This standard will be subject to periodic review, so it can be updated as necessary to respond to changes in climate science, subsequent international agreements and user experience.

Net zero aligned organizations

1 Scope

This document specifies principles, requirements and guidance for organizations to develop, implement and communicate a net zero aligned pathway. This includes setting targets, developing plans, taking actions and demonstrating verifiable progress towards these targets, in support of global net zero, respecting the Paris Agreement [2].

This document sets requirements to be fulfilled by organizations to make the following claims :

— 1. Net zero aspiration or

— 2. Net zero aligned transition plan; or

— 3. Net zero aligned progress; or

— 4. Net zero achievement.

It is applicable to a wide range of organizations (including companies, corporations, firms, partnerships, non-governmental organizations or academic institutions) in the public or private sectors.

It does not apply to territories (such as regions, countries, states or cities) or by sectors, as the basis for establishing frameworks applicable at those levels. Also, it is not to be used for products, services, events, brands, or claims relating to them, for which other standards are available.

This document has been developed primarily for non-financial institutions. ISO/FDIS 32212 [13] *Sustainable finance — Net zero transition planning for financial institutions* specifically addresses financing activities. However, this document can also be applied by financial institution to their non-financing activities.

Where relevant, this document makes reference to other existing standards and frameworks applicable to financial institutions, for example the Science-Based Target Initiative's (SBTi) Financial Institutions Net-Zero Standard and the Partnership for Carbon Accounting Financial's (PCAF) Global Accounting and Reporting Standards

This standard is greenhouse gas (GHG) programme neutral. If a greenhouse gas (GHG) programme is applicable, requirements of that greenhouse gas (GHG) programme are additional to the requirements of this standard.

Annex A provides guidance for the application of this document by SME users.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 14064-1:2018, *Greenhouse gases — Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals*

GHGP Corporate Accounting and Reporting Standard (2004)

GHGP Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011)

GHGP Scope 2 Guidance (2015)

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1 Terms related to climate action

3.1.1
organizational net zero
condition in which all anthropogenic *greenhouse gas emissions* (3.2.2) within the organization's *greenhouse gas inventory* (3.2.9) have been reduced to *residual emissions* (3.2.11) and these *residual emissions* (3.2.11) are counterbalanced by anthropogenic *carbon dioxide removal* (3.3.3) over a specific time period

Note 1 to entry: In most cases organizations will need to take many *greenhouse gas mitigation* (3.3.1) actions to reach *organizational net zero* (3.1.1).

Note 2 to entry: In this document the *organizational boundary* (3.4.2) includes the *organization* (3.4.1)'s *value chains* (3.4.3).

3.1.2
global net zero
condition in which anthropogenic *greenhouse gas emissions* (3.2.2) are balanced by anthropogenic *greenhouse gas removals* (3.2.6) over a specified time period, at global level

[SOURCE: IPCC, 2023: Climate Change 2023: AR6 Synthesis Report[1] : modified: "metric-weighted" removed from before anthropogenic, "time" and "at global level" added.]

3.1.3
net zero alignment
property of being aligned with the ambition level and time frame for action that supports the achievement of *global net zero* (3.1.2), aligned with the Paris Agreement [2]

3.1.4
organizational greenhouse gas budget
organizational GHG budget
cumulative *greenhouse gas emissions* (3.2.2) consistent with the organization's *net zero pathway* (3.1.7), from the *base year* (3.3.7) to the target year

Note 1 to entry: The organization's cumulative greenhouse gas emissions between the *base year* (3.3.7) and the target year should be equal to or less than the organization's greenhouse gas budget. An *organizational greenhouse gas budget* (3.1.4) can be established for a period between a *base year* (3.3.7) and an interim target year, or between a *base year* (3.3.7) and a net zero target year.

Note 2 to entry: An *organizational greenhouse gas budget* (3.1.4) encompasses emissions of all greenhouse gases, expressed in CO_2-equivalents, whereas the *global carbon budget* (3.1.5) includes CO_2 emissions only. Annexes D, E and F set out methodologies for deriving organizational greenhouse gas budgets from the *global carbon budget* (3.1.5) .

3.1.5
global carbon budget
the maximum amount of cumulative net global anthropogenic CO_2 emissions that would result in limiting global warming to a given level with a given probability, taking into account the effect of other anthropogenic climate forcers

[SOURCE: Definition (ii) of "carbon budget" in IPCC AR6 report Glossary (Annex VII)[14]]

3.1.6
interim target
Greenhouse gas mitigation (3.3.1) target for a specified period, prior to the achievement by the *organization* (3.4.1) of its net zero target

3.1.7
net zero pathway
quantified emissions trajectory for achieving net zero

Note 1 to entry: An organizational net zero pathway is a greenhouse gas emissions trajectory aligned with the Paris Agreement for the organization to follow on its journey to its net zero target. For most organizations a net zero target is a long-term target that will be reached after taking many *greenhouse gas mitigation* (3.3.1) actions.

Note 2 to entry: Scientific evidence is used to formulate coherent socio-economic and technical assumptions underpinning a net zero pathway.

Note 3 to entry: A net zero pathway can be at global level (leading to *global net zero* (3.1.2)) or at organizational level (leading to *organizational net zero* (3.1.1)).

Note 4 to entry: Global, regional, national and sectoral net zero pathways are referred to by organizations when setting their organizational net zero pathways and targets. A sectoral net zero pathway is an emissions trajectory for a whole industrial sector consistent with the necessary contribution of that sector to *global net zero* (3.1.2).

3.1.8
renewable energy
energy collected from sources that are naturally replenished at a rate equal or faster than extracted or used

Note 1 to entry: Sunlight, sun heat, wind, water flows, tides, waves, sustainable biomass, and geothermal heat are examples of sources of renewable energy.

Note 2 to entry: Peat is not considered a renewable source of energy in this standard due to the length of time for peat to re-accumulate after harvest (see IPCC 2019, Refinements of Guidelines for National Greenhouse Gas Inventories[15]).

[SOURCE: IPCC AR6, Working Group III, Annex 1 [16], modified (the original is "any form of energy that is replenished by natural processes at a rate that equals or exceeds its rate of use")]

3.2 Terms related to greenhouse gases

3.2.1
greenhouse gas
GHG
gaseous constituent of the atmosphere, natural or anthropogenic, that absorbs and emits radiation at specific wavelengths within the spectrum of infrared radiation emitted by the earth's surface, the atmosphere and clouds

Note 1 to entry: For a list of greenhouse gases, see the latest Intergovernmental Panel on Climate Change (IPCC) Assessment. The most significant anthropogenic greenhouse gases are carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), sulphur hexafluoride (SF_6), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and nitrogen trifluoride (NF_3). Emissions from these gases are often reported as carbon dioxide equivalents (CO_2e) using global warming potentials published in the latest IPCC report.

3.2.2
greenhouse gas emission
GHG emission
release of a *greenhouse gas* (3.2.1) into the atmosphere

[SOURCE: ISO 14050:2020 [17]3.9.8]

3.2.3
direct greenhouse gas emission
direct GHG emission
Scope 1 emission
greenhouse gas emission (3.2.2) from a *greenhouse gas source* (3.2.8) owned or controlled by the *organization* (3.4.1)

Note 1 to entry: These emissions are in Category 1 in ISO 14064-1:2018.

Note 2 to entry: In the Greenhouse Gas Protocol (GHGP) standards the term "Scope 1 emission" is the equivalent term to "direct greenhouse gas emission" in ISO 14064-1:2018 .

[SOURCE: ISO 14050:2020 [17]3.9.9 modified - "source" changed to singular and note 1 added.]

3.2.4
energy indirect greenhouse gas emission
energy indirect GHG emission
indirect GHG emission from imported energy
Scope 2 emission
greenhouse gas emission (3.2.2)from the generation of imported electricity, heat, cooling, steam or compressed air, purchased by an *organization* (3.4.1)

Note 1 to entry: This emissions category (category 2 in ISO 14064-1:2018) includes only *greenhouse gas emissions* (3.2.2) due to the fuel combustion associated with the production of final energy. It excludes all upstream greenhouse gas emissions (from cradle to power plant gate) associated with fuel, greenhouse gas emissions due to the construction of the power plant, and greenhouse gas emissions allocated to transport and distribution losses (which are included in other *indirect greenhouse gas emissions* (3.2.5)).

Note 2 to entry: Imported energy is energy that is purchased and consumed by the organization.

[SOURCE: ISO 14050:2020 [17] 3.9.11 modified - Note 1 added.]

3.2.5
other indirect greenhouse gas emission
other indirect GHG emission
Scope 3 emission
greenhouse gas emission (3.2.2) other than *energy indirect greenhouse gas emissions* (3.2.4), that is a consequence of an *organization's* (3.4.1) activities, but arises from *greenhouse gas sources* (3.2.8) that are not owned or controlled by the organization

Note 1 to entry: Other indirect emissions / Scope 3 emissions include *value chain* (3.4.3) greenhouse gas emissions, both upstream and downstream, not included in *direct greenhouse gas emissions* (3.2.3)/Scope 1 emissions (3.2.3) or *energy indirect greenhouse gas emissions* (3.2.4) / Scope 2 emissions (3.2.4). These emissions are referred to as categories 3-6 in ISO 14064-1:2018 Annex B.

[SOURCE: ISO 14050:2020 [17]3.9.12]

3.2.6
greenhouse gas removal
GHG removal
withdrawal of a *greenhouse gas* (3.2.1) from the atmosphere

[SOURCE: ISO 14050:2020 [17]3.9.22, modified : "by a greenhouse gas sink" removed, for consistency with definition of "greenhouse gas emission".]

3.2.7
avoided emission
avoided GHG emission
estimated difference in life cycle greenhouse gas emissions arising from a scenario with a solution compared to a reference scenario without the solution when reference scenario emissions are higher.

Note 1 to entry: A solution can be a good, a service, a policy, a project, an innovation.

Note 2 to entry: For organizations, avoided emissions are aggregated estimated differences in life cycle greenhouse gas emissions arising from the solutions offered by a reporting organization compared to a reference scenario when the reference scenarios emissions are higher.

Note 3 to entry: For organizations, avoided emissions arise outside the organizational boundaries of the reporting organization and have to be considered at aggregated level.

[SOURCE: ISO 14064-1 WD (Feb 2026). Modified: in Note 3 "happen" changed to "arise".]

3.2.8
greenhouse gas source
GHG source
process that releases a *greenhouse gas* (3.2.1) into the atmosphere

[SOURCE: ISO 14050:2020 [17] 3.9.4.]

3.2.9
greenhouse gas inventory
GHG inventory
list of greenhouse gas sources, *greenhouse gas sinks* (3.3.6), and their quantified *greenhouse gas emissions* (3.2.2) and *greenhouse gas removals* (3.2.6) over a specified time period

Note 1 to entry: In this document "greenhouse gas inventory" is used to refer to organizational greenhouse gas inventories and not to national inventories.

[SOURCE: ISO 14064-1:2018 3.2.6, modified: the words “over a specified time period ” have been added.]

3.2.10
greenhouse gas inventory boundary
GHG inventory boundary
grouping of the *greenhouse gas emissions* (3.2.2) and greenhouse gas removals from within the *organizational boundary* (3.4.2), as well as indirect emissions that are a consequence of the organization’s operations and activities

[SOURCE: ISO 14064-1:2018 3.4.8 modified. Term changed from "reporting boundary" to "greenhouse gas inventory boundary", "reported" and "those significant" removed.]

3.2.11
residual greenhouse gas emission
residual GHG emission
residual emission
anthropogenic *greenhouse gas emission* (3.2.2) remaining at the net zero target date, after implementation of all technically and economically feasible activities to reduce greenhouse gas emissions within an organization's *greenhouse gas inventory boundary* (3.2.10).

Note 1 to entry: Anticipated residual greenhouse gas emissions are those emissions that an organization considers infeasible to reduce when it sets and reviews its net zero target, based on the selected *net zero pathway* (3.1.7), consistent with a *global carbon budget* (3.1.5), and appropriate for the organization's sectoral and regional context. Anticipated residual greenhouse gas emissions are initially based on the selected net zero pathways. Over time the anticipated residual greenhouse gas emissions are revised, as pathways are updated and solutions advance, to reflect updated technical and economic feasibility.

Note 2 to entry: Clause 10.3 sets out requirements for organizations to conduct a feasibility analysis as they approach organizational net zero.

Note 3 to entry: Residual greenhouse gas emissions can be expected to be direct/Scope 1 emissions, indirect energy/ Scope 2 emissions or other indirect/Scope 3 emissions.

Note 4 to entry: Each year on its pathway to organizational net zero the organization will have greenhouse gas emissions which are referred to in this document as "remaining greenhouse gas emissions".

[SOURCE: IWA 42:2022 [4] 3.2.9, modified: "anthropogenic" added, "at the net zero target date" added, "taking all" changed to "implementation of all", "possible actions" changed to "technically and economically feasible activities", within an organization's inventory boundary" added.]

3.2.12
serviced emissions
greenhouse gas emissions that arise from the services delivered by professional service providers

Note 1 to entry: Professional service providers include, for example, consultants, lawyers, and advisers.

Note 2 to entry: The advice, information and guidance from professional service providers can enable increased reductions in the greenhouse gas emissions of their clients.

3.3 Terms related to climate change mitigation

3.3.1
GHG mitigation
human intervention to reduce *greenhouse gas emissions* (3.2.2) or to enhance *greenhouse gas removals* (3.2.6)

[SOURCE: ISO 14050:2020 [17]3.8.6 (definition of climate change mitigation)]

3.3.2
greenhouse gas emission reduction
GHG emission reduction
emission reduction
quantified decrease in *greenhouse gas emissions* (3.2.2) specifically related to or arising from an activity between two points in time

[SOURCE: ISO 14050:2020 [17], 3.9.17, modified: "emission reduction" added as an admitted term. “Between a baseline scenario and the project” replaced with “specifically related to or arising from an activity between two points in time.”]

3.3.3
carbon dioxide removal and storage
CO_2 removal
carbon dioxide removal
CDR
anthropogenic withdrawal of a *greenhouse gas* (3.2.1) from the atmosphere to storage within geological, terrestrial or ocean reservoirs, or in products

Note 1 to entry: *Carbon dioxide removal and storage* (3.3.3) includes existing and potential anthropogenic enhancement of biological or geochemical CO_2 sinks and direct air capture, but excludes natural CO_2 uptake not directly caused by human activities.

Note 2 to entry: Storage in products can present the risk of low durability (requirements for quality criteria for carbon dioxide storage are provided in clause 12.4). There is wide interest in this topic and future developments may provide greater confidence in the suitability of some product types.

Note 3 to entry: In this document there are two terms for removals that have distinct meanings and use cases. The term "*carbon dioxide removal and storage* (3.3.3) " includes storage over time and is distinct from *greenhouse gas removal* (3.2.6) which refers to annual fluxes in an organization's *greenhouse gas inventory* (3.2.9) .

Note 4 to entry: At the time of writing this document, there are no commercially available technologies for removing and storing non-CO_2 greenhouse gases from the atmosphere. However, these may become available in future and this definition is not intended to exclude their use in the context of *net zero alignment* (3.1.3) for organizations.

[SOURCE: IPCC AR6 Annex VII Glossary [14] definition of "carbon dioxide removal" modified: "activities removing carbon dioxide (CO_2)" replaced with "withdrawal of a greenhouse gas", "and durably storing it in" replaced with "to storage within."]

3.3.4
greenhouse gas removal enhancement
GHG removal enhancement
removal enhancement
quantified increase in *greenhouse gas removals* (3.2.6) specifically related to or arising from an activity between two points in time

[SOURCE: ISO 14068-1:2023 [12] modified: "specifically related to or arising from an activity" added, "relative to a *baseline*" deleted.]

3.3.5
carbon credit
tradeable intangible instrument, issued by a carbon-crediting programme, representing a *greenhouse gas emission reduction* (3.3.2) or *greenhouse gas removal enhancement* (3.3.4) equivalent to one metric tonne of carbon dioxide equivalent (CO_2e)

Note 1 to entry: In this standard, a distinction is made between carbon credits coming from emission reductions and CO_2 removals (which can be in the form of carbon credits, if the removals take place outside an organization's *greenhouse gas inventory boundary* (3.2.10)). Other schemes and standards have different interpretations of reduction and avoidance credits, but in this document the reduction credits is used generically to apply to both reduction and avoidance credits.

Note 2 to entry: Carbon credit projects are validated and their impacts verified independently in accordance with the requirements of carbon-crediting programmes, which then issue carbon credits with unique serial numbers. Carbon credits are issued, transferred and tracked in a secure (e.g. electronic) registry, and ultimately retired or administratively cancelled to ensure they cannot be used or claimed more than once.

[SOURCE: ISO 14068-1:2023 [12], modified - "certificate" replaced with "intangible instrument, issued by a carbon crediting programme". Alternative term "greenhouse gas credit" not used. Note 1 modified.]

3.3.6
greenhouse gas sink
GHG sink
process that removes a *greenhouse gas* (3.2.1) from the atmosphere

Note 1 to entry: A process can be natural or anthropogenic.

[SOURCE: ISO 14050:2020 [17], 3.9.5. Note from ISO 14068-1:2023 [12] added.]

3.3.7
base year
specific, historical period identified for the purpose of comparing greenhouse gas emissions or *greenhouse gas removals* (3.2.6) or other greenhouse gas-related information over time

[SOURCE: ISO 14064-1:2018 , 3.2.10]

3.3.8
net negative greenhouse gas emissions
net negative GHG emissions
condition in which anthropogenic *greenhouse gas removals* (3.2.6) exceed anthropogenic *greenhouse gas emissions* (3.2.2)

[SOURCE: Based on definition in IPCC AR6 Annex VII Glossary[14]]

3.3.9
environmental commodity certificate
ECC
contractual instrument representing a verifiable environmental attribute related to greenhouse gases associated with a low carbon product or technology

EXAMPLE Existing ECCs on the market are mainly in energy sector (e.g. biogas, sustainable aviation fuel, electricity), while emerging ECCs are in development for other sectors like agricultural products and industrial commodities.

Note 1 to entry: Depending on the chain of custody model used, the environmental attribute will either be physically connected to the product or separate.

Note 2 to entry: ECCs convey positive environmental attributes.

Note 3 to entry: Other initiatives, frameworks and standards include environmental commodity certificates (ECCs) in broader terms (such as environmental attribute certificates). In this document, *carbon credits* (3.3.5) are not ECCs, and energy attribute certificates are a sub-set of ECCs.

Note 4 to entry: Chain of Custody (CoC) models, such as described in ISO 22095:2020 [18] ISO 22095, can support environmental commodity certificates relating to various types of *greenhouse gas sources* (3.2.8)

3.3.10
low carbon energy
energy derived from sources which generate less than 100g CO_2e/kWh greenhouse gas emissions throughout the whole life cycle of the energy production

Note 1 to entry: Sources of *low carbon energy* (3.3.10) include either *renewable energy* (3.1.8) sources, or non-renewable non-fossil fuel energy sources, including but not limited to nuclear.

Note 2 to entry: The threshold (100g CO_2e/kWh) may be revised over time, as technologies improve.

[SOURCE: ISO/FDIS 14021 [19]]

3.3.11
climate solution
low- or lower-emissions alternatives, providing the same or equivalent function, that replace higher emission products or technologies, or that enable a circular flow of resources with lower life cycle emissions

Note 1 to entry: The solution's greenhouse gas emissions are expected to decrease over time.

Note 2 to entry: Products include both goods and services.

Note 3 to entry: Life Cycle Assessments can demonstrate whether products or services are low- or lower-emissions alternatives.

3.3.12
deforestation
direct human-induced conversion of forested land to non-forested land

Note 1 to entry: Tree canopy cover below a 10% threshold is usually considered non-forested land.

[SOURCE: UNFCCC Marrakesh Ministerial Declaration 2001 [20]]

3.4 Terms relating to organizations seeking to achieve net zero

3.4.1
organization
person or group of people that has its own functions with responsibilities, authorities and relationships to achieve its objectives

Note 1 to entry: The concept of organization includes, but is not limited to, sole-trader, company, corporation, firm, enterprise, authority, partnership, association, charity or (financial) institution, or part or combination thereof, whether incorporated or not, publicly-owned or private.

Note 2 to entry: A group of organizations with collective objectives can also be considered as one organization if the group has operational or financial control over, or equity share in the organizations in the group.

[SOURCE: ISO 14064-1:2018 , 3.4.2 modified: "(financial)" added into Note 1, and Notes 2 added.]

3.4.2
organizational boundary
grouping of activities or facilities, or both, in which an organization exercises operational or financial control or has an equity share

[SOURCE: ISO 14064-1:2018 clause 3.4.7]

3.4.3
value chain
entire sequence of activities or parties that provide or receive value through the provision of a product or service

Note 1 to entry: Value chain greenhouse gas emissions include direct greenhouse gas emissions/Scope 1 emissions, energy indirect greenhouse gas emissions/Scope 2 emissions and other indirect greenhouse gas emissions/Scope 3 emissions.

Note 2 to entry: The value chain includes other organizations (e.g. suppliers, retailers, service providers), end-users of products and services such as customers or the public, and end-of-life operations (e.g. recycling, incineration and land-filling).

[SOURCE: ISO 14050:2020 [17] Modified: "or service" added. Notes 1 and 2 added.]

3.4.4
top management
person or group of people who direct and control an *organization* (3.4.1) at the highest level

Note 1 to entry: Top management has the power to set and implement strategy, to delegate authority and provide resources within the organization.

Note 2 to entry: Those in top management roles can be members of an organization's board, owners, the senior operational management team or others in roles contributing to the direction and control of the organization at the highest level.

[SOURCE: ISO 14050:2020 [17] Modified: Notes 1 and 2 added]

3.4.5
stakeholder
interested party
person or *organization* (3.4.1) that can affect, be affected by, or perceive itself to be affected by a decision or activity

EXAMPLE Examples of stakeholders include consumers, customers, communities, suppliers, regulators, non-governmental organizations, sector bodies, investors, lenders and employees (including those of the organization and of suppliers)).

[SOURCE: ISO 14068-1:2023 [12] Note modified by addition of "sector bodies", "lenders" and text in brackets.]

3.4.6
competent
able to apply knowledge and skills to achieve intended results

[SOURCE: modified from ISO 14050:2020 [17] definition of "competence"]

3.4.7
documented information
information required to be controlled and maintained by an *organization* (3.4.1) and the medium on which it is contained

Note 1 to entry: Documented information can be in any format and media, and from any source.

[SOURCE: ISO 14050:2020 [17] 3.1.11 modified - Note 1 added (from ISO 14001:2026 [21]).]

3.4.8
indicator
quantitative, qualitative or binary variable that can be measured, calculated or described, representing the status of operations, management, conditions or impacts

[SOURCE: ISO 14050:2020 [17] 3.2.24]

3.4.9
verification
process for evaluating a statement of historical data and information to determine if the statement is materially correct and conforms to criteria

Note 1 to entry: Verification is applied to claims regarding events that have already occurred or results that have already been obtained (confirmation of truthfulness).

[SOURCE: ISO 14064-1:2018 clause 3.4.9, Note 1 to entry added.]

3.4.10
validation
process for evaluating the reasonableness of the assumptions, limitations and methods that support a statement about the outcome of future activities

[SOURCE: ISO 14064-1:2018 clause 3.4.10]

3.4.11
peer review
review of work performed by others suitably qualified to do the same work

[SOURCE: ISO/IEC 20246:2017 [22] (en), 3.14 modified: "product" removed, "suitably" added.]

4 Principles

4.1 General

The principles in 4.2 to 4.11 are the foundation for organizations to achieve and demonstrate net zero alignment. They guide the application of the requirements and recommendations in this document.

Application of these principles is fundamental to ensure that the achievement and demonstration of organizational net zero alignment is undertaken in a robust, fair and verifiable manner, and is communicated clearly and accurately.

4.2 Urgency

The organization takes rapid and ongoing action to contribute effectively to global efforts to limit the increase in global average temperature to 1,5°C above pre-industrial levels by the end of the 21st century, with low or no overshoot. Organizations do this by achieving organizational net zero as soon as possible.

NOTE A common date for net zero targets is 2050, while some organizations with higher capabilities and resources set net zero targets well-before.

4.3 High Ambition

The organization sets targets and takes action, making early, deep, rapid and sustained GHG reductions (front-loading) in order to achieve organizational net zero as soon as possible.

The organization also contributes towards global net zero across its spheres of influence and invests early in CO_2 removals.

Annex B provides examples of actions organizations can take to demonstrate high ambition.

4.4 Supporting transition

net zero alignment at organizational level takes account of the need for sustainable development and the urgent need, to transition away from activities that generate significant GHG emissions, and is not used to perpetuate “business as usual”.

4.5 Science based approach

Decision-making by organizations in relation to their net zero targets, emissions pathways, and efforts to achieve organizational net zero , and to protect and restore nature, are based on current scientific evidence including indigenous and other local knowledge. Organizations' decisions are reviewed regularly, and organizations' targets, policies and actions are adapted as knowledge and science evolves.

4.6 Conservativeness

Assumptions, quantifications, estimates, procedures and claims involved in achieving and demonstrating net zero alignment ensure that targets can be met within the planned timeframe, and the current status and progress on the net zero pathway are not overstated.

4.7 Avoiding adverse impacts

Measures or activities contributing to the achievement of organizational net zero avoid, or where this is not feasible, minimize, adverse impacts on the environment and society.

4.8 Credibility

The reasonableness of the assumptions, limitations, plans and methods to support an organization's claim of net zero alignment can be validated and their subsequent results can be demonstrated to be verifiable, using robust assurance standards and practices, developed by independent third parties.

4.9 Equity and justice

Equity and justice guide the transition to net zero, ensuring that social risks and opportunities are anticipated, assessed, and fairly addressed.

Meaningful dialogue, engagement and inclusive participation of affected stakeholders, especially vulnerable and marginalized groups, through enabling and empowerment (see clause11.3.6) actions, are essential for appropriate planning and implementation of the transition.

Actions to mitigate GHG emissions, safeguard human rights and contribute to sustainable development to ensure a just transition.

Decision-making reflects a fair distribution of both the burdens and benefits of climate action, ensuring equitable and fair share of responsibility and inclusive outcomes, taking into account the differing economic and technical capacities of countries and organizations

4.10 Transparency

Relevant and sufficient information is made publicly available to enable intended users and other stakeholders to understand all statements concerning a commitment to, progress towards and achievement of organizational net zero, and to make decisions with reasonable confidence.

NOTE Information can be made publicly available on the the organization’s website, in publicly filed documents or other appropriate medium.

4.11 Value chain and life cycle approach

Determination of net zero alignment includes GHG emissions and GHG removals within the whole value chain of the organization , including upstream and downstream processes.

5 General Approach

5.1 Framework

This document establishes a framework for organizations to work towards and achieve organizational net zero , by following the steps in Figure 2 and to make corresponding claims along the way (see Clause 16).

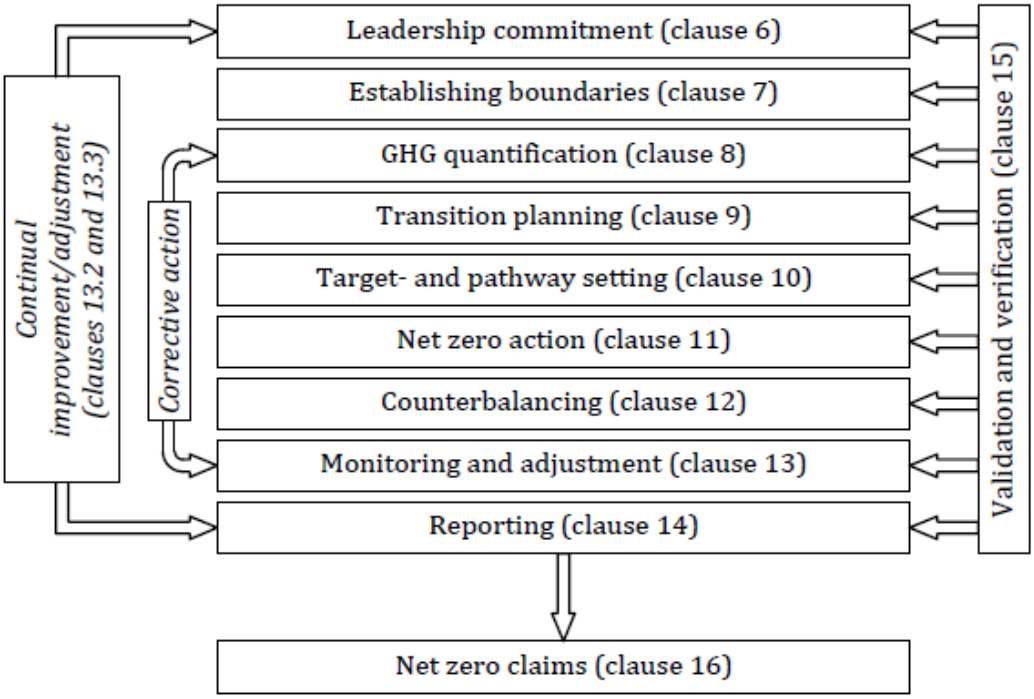


Figure 2 — Framework showing the steps to be taken by organizations

5.2 Mitigation hierarchy

The organization shall define and disclose its GHG mitigation approach, ensuring alignment with the mitigation hierarchy while considering its capacity and ability to take effective action.

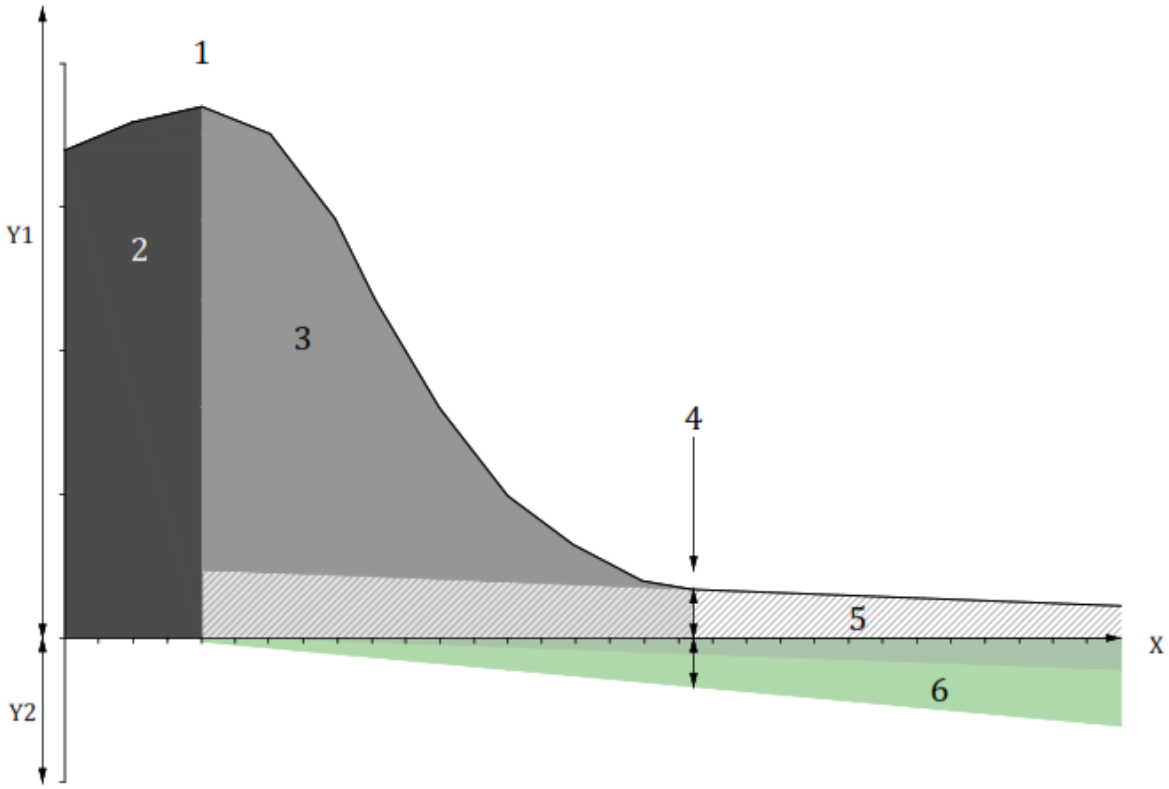
Priority shall be given to reducing GHG emissions within the organization's GHG inventory boundary over other mitigation actions.

When implementing plans to enable counterbalancing of their residual emissions at their net zero target date, (see clauses 12.2 and 12.4) organizations should prioritize CO_2 removals within their organizational boundary over CO_2 removals elsewhere, where feasible.

In addition, before reaching, and having reached, organizational net zero , organizations shall take actions to contribute to global net zero as set out in clause 11.3.

5.3 Net zero pathway

An illustrative example of an organization's net zero pathway is shown in Figure 3 . Requirements for target and pathway setting are found in Clause 10.



Key

X	Time
Y1	GHG emissions
Y2	Removals
1	Base year emissions
2	Historical emissions
3	Remaining emissions
4	Organizational net zero (clause 3.1.1) reached
5	Residual emissions (clause 3.2.11)
6	CO_2 removal and storage (clause 3.3.3)

Figure 3 — Illustrative example of an organization's net zero pathway

NOTE The grey shaded areas represent the organization's GHG emissions, of which a proportion are forecast to be residual GHG emissions at net zero. The entire grey shaded area represents the organization's cumulative GHG emissions. While on the pathway to organizational net zero , the organization's total emissions in a given year are referred to in this document as "remaining GHG emissions". The green shaded areas represent CO2 removal and storage, both within (darker green) and outside (lighter green) the organization's GHG inventory boundary..

5.4 Role of carbon credits

When counterbalancing residual emissions with removals at organizational net zero (seeClause 12), organizations may use removals credits.

On the pathway to organizational net zero , removals credits may be used to achieve the milestones that organizations set (see clause 12.2) to prepare for counterbalancing all residual emissions at organizational net zero .

In addition, all types of carbon credits may be used by organizations for the following purposes:

— as an action to contribute to global net zero (see clause 11.3.3);

— as one possible remedial action, in specified circumstances, in order to maintain or regain a claim if an organization misses an interim target (see clause 16.6);

— as a high ambition activity, to address historical emissions (see Annex B).

Carbon credits shall not be used to claim progress towards interim or net zero GHG emission reduction targets.

NOTE ISO 14068-1:2023 [12] sets out an approach for organizations to use carbon credits to make claims of carbon neutrality based on offsetting their carbon footprints.

5.5 Documented information

The organization shall establish, maintain and regularly update the documented information necessary to support its transition to, and achievement of, organizational net zero . Documented information that is to be retained shall be stored and preserved in an appropriate format or medium.

The organization shall fulfil all the relevant requirements in ISO 14064-1:2018 for documentation, documented information and retention of documents on the quantification and reporting of the organization's GHG emissions and removals.

NOTE 1 In ISO 14064-1:2018 , clauses 5.1, 5.2 , 6.1, 6.2, 6.4.2, 7.1, 8.1.1, 8.1.2, 8.2, 9.2, and 9.3.1 all contain requirements related to documentation, documented information and retention of documents.

If using the GHGP standards, the organization shall follow the recommendations on documented information on pages 50-52 (Chapter 7) of the GHGP Corporate Standard [9] .

The organization shall maintain documented information to support any claim made in relation to fulfiling the requirements in this document.

NOTE 2 Additional requirements for documented information can be found in other clauses.

6 Top management leadership, commitment and responsibilities

Top management shall demonstrate leadership and commitment to achievement of the organization’s interim targets, its net zero targets and their maintenance, and to supporting achievement of global net zero , taking account of the principles provided in and the need for a just transition, by:

a) taking accountability for achieving and demonstrating organizational net zero , and for any related claims;

b) providing strategic direction, oversight and support, ensuring that corporate strategies are aligned with delivering the organization's net zero commitments;

c) ensuring alignment between its policies, targets and actions including engagement and advocacy towards stakeholders and policy-makers;

d) ensuring consideration is given to addressing social or environmental risks and impacts that arise as a consequence of the organization's GHG mitigation actions;

e) ensuring the provision of adequate resources to enable the organization to set and achieve its net zero target;

f) disclosing any shareholder voting records on climate-related issues, if appropriate to the organization;

g) publicly committing to achieving the organization's net zero target;

h) defining leadership responsibilities for working towards organizational net zero;

i) appointing competent members of the organization's leadership to take responsibility for actions and ensuring necessary governance processes are in place;

j) ensuring competent persons are appointed to relevant roles and supporting them in fulfilling their responsibilities;

k) considering the implementation of incentives or other performance management measures for delivering its net zero targets;

l) ensuring actions needed to transition to organizational net zero are prioritized as necessary throughout the organization;

m) reviewing the organization's net zero pathway and transition plan at planned intervals, but at least annually, to ensure its continuing suitability, adequacy and effectiveness, and that adequate progress has been achieved and, if not, that suitable remedial action is planned; and

n) publicly and regularly communicating transition plans and reporting progress (see Clause 14).

Additionally, top management can demonstrate commitment by:

o) ensuring the establishment and development of relationships with organizations in its value chains to facilitate and support net zero;

p) promoting innovative strategies, business models, products, and solutions that contribute to the achievement of the organization's net zero targets;

q) advocating for climate policy and regulation consistent with the Paris Agreement [2] ;

r) ensuring the integration of climate risk management indicators, measures and controls into organizational processes and core risk management processes and policies;

s) incorporating net zero targets into core governance documents (e.g. articles of association, charters).

7 Establishing boundaries

The organization shall establish and document its GHG inventory boundary for the purposes of quantification, target and pathway setting, transition planning, GHG mitigation action, monitoring progress and reporting.

The organization's GHG inventory boundary shall be established in accordance with the requirements for establishing the organizational and reporting boundaries in ISO 14064-1:2018 Clause 5 .

Or, if using the GHGP standards, the organization's GHG inventory boundary shall be established in accordance with the requirements in Chapters 3 and 4 of the GHGP Corporate Standard [9], the minimum Scope 3 boundary in Chapter 5 of the GHGP Value Chain (Scope 3) Standard [11] and the requirements in Chapter 6 of the GHGP Value Chain (Scope 3) Standard [11].

All direct GHG emissions / Scope 1 emissions, all energy indirect GHG emissions / Scope 2 emissions and significant other indirect GHG emissions / Scope 3 emissions shall be included in the organization's GHG inventory boundary.

NOTE 1 Guidance on identifying significant other indirect GHG emissions can be found in ISO 14064-1:2018, Annex H and in the GHGP Corporate Standard [9], Chapter 4, and GHGP Value Chain (Scope 3) Standard [11], Chapter 6 and Table 6.1, which provide criteria and examples for determining significance and relevance of indirect emissions.

NOTE 2 Any category of emissions in Scope 3 that is determined in this standard to be significant for target-setting (see clause 10.6.2) is significant for quantification.

The organization shall disclose its justification for the exclusion of any other indirect GHG emissions / Scope 3 emissions from its GHG inventory.

NOTE 3 For requirements on consolidation approaches see ISO 14064-1:2018 clause 5.1 and Annex A, or the GHGP Corporate Standard [9] Chapter 3 and the GHGP Value Chain (Scope 3) Standard [11] Chapter 5 Section 2, which describe equity share, financial control, and operational control approaches for GHG inventory consolidation..

NOTE 4 The Partnership for Carbon Accounting Financials (PCAF) Global Accounting and Reporting Standards provide guidance on boundary setting for indirect emissions for financial institutions.

8 Quantification of greenhouse gas emissions and removals

8.1 General

The organization's GHG emissions and removals shall be quantified annually in accordance with the requirements set out in ISO 14064-1:2018 Clause 6.

Or, if using the GHGP standards, the organization's GHG emissions and removals shall be quantified following the principles and requirements set out in the GHGP Corporate Standard [9], Chapter 6 and 7, and the GHGP Value Chain (Scope 3) Standard [11], Chapters 7 and 8, which provide detailed methodologies for quantification, data collection, and allocation of emissions and removals.

Sector-specific quantification standards may be used, provided the relevant requirements of ISO 14064-1:2018 (see clause 6) or of the GHGP standards (see the GHGP Corporate Standard [9] , Chapter 6, and the GHGP Value Chain (Scope 3) Standard [11], Chapter 7) are met.

All direct GHG emissions and all significant indirect GHG emissions shall be included in the GHG inventory. For direct and indirect GHG sources where activity data are not available, GHG emissions shall be estimated or reported as unavailable. See clause 8.3 for requirements on improving emission quantification.

The organization shall quantify its GHG emissions using a consistent approach across all territories where it operates. Where country- or region-specific (or measured) emission factors from credible sources are available, they shall be used.

NOTE 1 Further guidance for organizations on quantifying their GHG emissions and removals is provided in ISO 14064-1:2018, in the GHGP Corporate Standard [9] (including the GHGP Scope 2 Guidance (2015) [10]) and in the GHGP Value Chain (Scope 3) Standard [11] .

NOTE 2 Information on the quantification of GHG emissions related to products in value chains can be found in ISO 14067:2018 [7] and in the GHGP Product Life Cycle Accounting and Reporting Standard [23] .

NOTE 3 The Partnership for Carbon Accounting Financials (PCAF) provides a standard for quantifying Scope 3 category 15 emissions (GHGP emission category classification) for financial institutions.

For quantification of GHG emissions from consumed electricity the organization shall use the location-based approach, in accordance with ISO 14064-1:2018 Annex E. In addition, the organization may account and report GHG emissions from consumed electricity using the market-based approach.

NOTE 4 Annex E of ISO 14064-1:2018 and the GHGP Scope 2 Guidance (2015) [10] cover the use of contractual instruments for reporting of GHG emissions from imported electricity using the market-based approach, for organizations opting to use this approach in addition to the location-based approach.

The organization shall assess the uncertainty associated with its chosen quantification approaches (see ISO 14064-1:2018 clause 8.3 and guidance in the GHGP Corporate Standard [9] chapter 7 and the GHGP Value Chain (Scope 3) Standard [11] Appendix B).

Professional service providers should estimate potential serviced emissions (enabled and avoided), using recognised methodologies and standards such as ISO 14064-2:2019 [5]

8.2 Base year

The organization shall select and establish its base year GHG inventory, in accordance with the requirements of ISO 14064-1:2018 clause 6.4.1 or the GHGP Corporate Standard [9] Chapter 5, from which to set pathway and targets (see Clause 10), to plan action, and to measure progress against its targets.

The organization shall develop, document, apply and disclose a base year review and recalculation procedure (see ISO 14064-1:2018 clause 6.4.2 and the GHGP Corporate Standard [9] chapter 5, pages 35-39).

8.3 Continual improvement of greenhouse gas quantification

The organization shall implement processes to assess and continually improve the quality and completeness of data gathered to quantify GHG emissions and GHG removals.

The organization should increase the use of primary activity data, supplier-specific and locality-specific emissions factors on GHG sources and GHG sinks wherever possible.

documented information shall be available as evidence of the organization 's processes for the continual improvement of GHG quantification.

9 Transition planning

9.1 Developing a transition plan

The organization shall establish a plan for GHG mitigation and wider actions to enable achievement of its interim targets and net zero target that:

a) is based on reliable, quantified data;

b) takes account of the mitigation hierarchy (see clause 5.2)

c) is integrated into the organization's core business plan, financial planning and budgeting processes;

d) addressesdirect GHG emissions /Scope 1 emissions, energy indirect GHG emissions /Scope 2 emissions and significant other indirect GHG emissions /Scope 3 emissions, and anticipated residual emissions;

e) sets timelines for actions to be taken and how these actions relate to targets;

f) describes how progress against targets will be managed, monitored, reported and verified by a 1st, 2nd or 3rd party. If an organization does not have complete or specific GHG emissions data to track progress against GHG emissions targets, it should include in its plan actions likely to reduce GHG emissions and proxy metrics for tracking progress on these actions;

g) ensures meaningful participation and dialogue with stakeholders;;

h) takes into account and mitigates the potential risk of a consequent rise in GHG emissions beyond its GHG inventory boundary;;

i) includes measures to assess potential and actual social or environmental risks and impacts that arise as a consequence of the organization's GHG mitigation actions, established by carrying out corporate due diligence, and to implement any necessary preventive measures;

NOTE The UN Guiding Principles on Business and Human Rights[24] and the ILO's Tripartite Declaration of Principles[25] (adapted from COP26 Just Transition Declaration and the OECD Guidelines for Multinational Enterprises [26]) address these risks.

j) includes details of any planned use of carbon credits in support of global net zero ;

k) establishes an approach for any validation of the plan or verification of its results;

l) includes justification of the assumptions made and the decisions taken in establishing the plan;

m) is available as documented information;

n) is updated at least every five years and whenever necessary; and

o) is publicly available.

When developing its transition plan the organization should assess the implications of "locked in emissions" of its assets and any potential stranding of its assets, and plan accordingly.

The organization may withhold confidential information from publication, provided the published plan is credible.

The organization shall review its anticipated residual GHG emissions at least during each update of its transition plan by regularly assessing, in collaboration with third parties, whether GHG emissions can be reduced further than previously expected.

9.2 Content of a transition plan

9.2.1 General content of a transition plan

The organization's transition plan shall include

a) the net zero transition target and key interim milestones;

b) an estimation of its anticipated residual emissions;

c) the business opportunities and risks of net zero alignment ; and

d) how the organization will:

1) meet interim and net zero targets by taking GHG mitigation action (see clause 11.1 and examples in Annex C);

2) quantify its GHG emissions and its mitigation measures;

3) contribute to, and set targets for, the development or adoption, or both, of climate solutions , where possible (for example, through the use of environmental commodity certificates);

4) transition to low carbon energy ;

5) develop, finance and implement low carbon solutions;

6) address key dependencies and external factors that may affect the organization's ability to execute its plan;

NOTE Further guidance can be found in GRI 102: Climate Change: 102-1 Transition plan for climate change mitigation [27] and other relevant standards.

7) support a just transition;

8) build its capacity to counterbalance anticipated residual emissions at its net zero target year through investment in durable removals, in accordance with Clause 12; and

9) advocate for global net zero in accordance with clause 11.3.4.

To support the principle of equity and justice (4.9) organizations with greater resources and greater historical responsibility should collaborate with those organizations with less capability or capacity to act.

9.2.2 Governance and finance

The organization's transition plan shall include how the organization will:

a) align organizational strategy, including investments, divestments and asset management (such as decommissioning), with its net zero targets;

b) consider the implications of its transition plan for financial performance and cash flows, over the short-, medium-, and long-term;

c) provide sufficient financial, human, technical and other resources to meet its net zero target;

d) define and assign roles and responsibilities for the actions required by this document (e.g. a person or team responsible for engagement throughout the organization's value chain);

e) build capability, including competence and awareness to oversee the transition plan;

f) engage with suppliers, customers and other appropriate stakeholders to collaborate to reduce significant other indirect GHG emissions/Scope 3 emissions; and

NOTE ISO/FDIS 32212 [13] *Sustainable finance — Net zero transition planning for financial institutions*, is aimed at the financial sector, but its provisions could also be helpful to other organizations making investment decisions.

g) advocate for global net zero in accordance with 11.3.4 .

9.2.3 Greenhouse gas emissions reduction

The organization's transition plan shall include how the organization will:

a) improve energy efficiency, for example by optimizing operations, reducing energy losses, upgrading technology and improving the energy efficiency of its production;

b) reduce its energy indirect GHG emissions /Scope 2 emissions through the purchase and deployment of additional low carbon/renewable energy across the locations where it consumes imported energy; and

c) reduce other indirect GHG emissions /Scope 3 emissions of the organization through updating relevant products and services to reduce GHG emissions from their use, to enable the circular flow of resources, and to enable sustainable lifestyles and purchase decisions by customers.

9.2.4 Monitoring, evaluation and reporting

The organization's transition plan shall include how the organization will:

a) monitor progress towards its targets, and, if applicable, with respect to its GHG budget;

b) communicate information to interested parties on expected and actual progress towards its targets, including the reporting frequency (see clauses 14.1 and 14.2);

c) validate targets and verify progress;

d) review the effectiveness of measures to address social and environmental impacts of its actions;

e) periodically review risks related to the achievement of planned GHG mitigation actions; and

f) adjust its transition plan and pathway as required in response to monitoring and evaluation activities.

10 Target- and pathway-setting for greenhouse gas emission reductions

10.1 General

The organization shall set the following:

— A long-term target to reach organizational net zero by the date required in the chosen net zero pathway that meets the criteria listed in clause 10.2;

— Interim GHG emission reduction targets that are aligned with the organization's net zero pathway, to enable achievement of the organization's net zero target; and

— Interim GHG emissions targets, for which the first interim target shall be no more than 5 years from the target setting year (when the targets are set). Subsequent interim targets shall be set at intervals of no more than 10 years.

NOTE 1 Five years is a business planning period used by many organizations. Also, if interim targets are too far apart, it can be difficult for organizations to track progress and for stakeholders to hold organizations accountable for progress towards net zero targets.

The organization shall set long-term and interim GHG emission reduction targets:

— based on and compared to a verifiable base year GHG inventory;

— that include all relevant types of GHGs;

— as separate targets for each scope of emissions;

— for all direct GHG emissions/Scope 1 emissions;

— for all energy indirect GHG emissions/Scope 2 emissions; and

— for other indirect GHG emissions / Scope 3 emissions, covering all significant indirect GHG emissions categories.

NOTE 2 As required by ISO 14064-1:2018 clause 6.3, GHG emissions are converted to CO_2 equivalents (CO_2e) using Global Warming Potentials (GWPs) over a 100-year time horizon using the characterization factors published in the latest IPCC report. GHG emission reduction targets are then set on an aggregated basis for total CO_2 equivalents.

NOTE 3 GHG emission reduction is calculated as the difference between the current year's GHG emissions and a verifiable base year GHG emissions expressed in mass unit of CO_2e (e.g. kg or ton of CO_2e).

When setting targets, the organization shall use a GHG inventory for a base year that is representative of the organization’s activities.

NOTE 4 A representative base year reflects typical operations, avoiding years with anomalies such as extended shutdowns, natural disasters, one-off events, or unusual economic conditions.

When determining its contribution to net zero, including its pathway and targets, the organization should consider the benefits and risks that implementation of those targets and pathways could provide to the territories in which it operates, including long-term costs to society of inaction on climate change.

Organizations that produce climate solutions wholly, or in part, for net zero transition shall set separate targets for those parts of the organization , using relevant metrics in physical units (or functional units) that reflect high ambition for reductions available to that organization (see Annex B).

NOTE 5 Climate solutions are technologies covered in selected global net zero pathways. For example the IEA Report Net Zero by 2050 [28] and the IPCC AR6 WG3 report, 2023 [29] discuss various technologies to help transition away from fossil fuel use without abatement.

NOTE 6 See ISO 14067:2018 [7] for functional unit definition.

Startups in upper middle, lower middle and low income countries (according to World Bank income classification[30]) may set their first interim target (no more than 5 years after target-setting year) based on

intensity (e.g. kg CO_2e/kg of product) derived from underlying global, sectoral or national net zero pathways appropriate for the organization's sectoral and regional context. Upon completion of the first interim target , these organizations shall set long-term and other interim GHG emission reduction targets required in the first paragraph of this clause 10.1 (above).

Additional intensity targets set by the organization to track progress shall use product or physical emissions intensity only (e.g. kg CO_2e/kg of cement) not economic intensity (e.g. kg CO_2e/$ revenue) since the latter is subject to price variations by commodity, exchange rate volatility, and other market conditions. Financial institutions may use economic intensity (e.g. kg CO_2e/$ revenue) according to ISO/FDIS 32212 [13].

The organization shall derive the anticipated quantity of residual emissions from the chosen net zero pathway .

10.2 Selecting relevant sectoral net zero pathways

The organization shall select a net zero pathway consistent with the temperature goals defined by the Paris Agreement [2]. The net zero pathway should reflect the principles of equity and justice (see Clause 4.9) so that larger carbon budgets result for organizations operating in emerging economies.

The organization shall only use underlying global, sectoral or national net zero pathways that

a) are appropriate for the organization's sectoral and regional context;

b) have been developed by an independent third party, taking account of climate science;

NOTE 1 Individuals from the organization and from other organizations in the same sector are not precluded from participation in the work of the independent third party in developing the pathway, provided they do not compromise its impartiality.

c) have been subject to peer review or similar independent review; and

d) are reviewed at regular intervals following initial development;

and for which

e) scientific evidence does not raise high feasibility concerns about the scaling of future technology to achieve the pathway;

NOTE 2 [31] IPCC AR6, WG3, Annex 3, table 8 provides guidance on feasibility dimensions, associated indicators and thresholds for the onset of medium and high concerns about feasibility.

f) assumptions, hypotheses and calculations are publicly available and accessible free of charge; and

g) the underlying allocation principles ensure that cumulative GHG emissions across all sectors and all countries add up to a global carbon budget aligned with the temperature goals defined by the Paris Agreement[2].

NOTE 3 Examples of eligible sectoral pathways include those developed from the IPCC 1,5°C Special Report [32] , the IEA Report Net Zero by 2050 [28] and the One Earth Climate Model [33]. Standard EN 18074:2025 [34] provides a framework for development of sectoral transition plans that align with global sustainability goals.

The organization shall disclose whether the chosen net zero pathway and allocation methodology adhere to the equity and justice principle 4.9: if so, the organization shall disclose how equity and justice are taken into account, and if not, this limitation shall be acknowledged.

NOTE 4 Most mainstream sectoral pathways (e.g., IEA NZE, NGFS scenarios) are based on cost-optimization and do not inherently incorporate equity and justice. Equity and justice can be incorporated at different stages of the allocation process: for example global to national to sector to organization, or global to sector to national to organization.

NOTE 5 Sectoral pathways for 1,5°C apply irrespective of whether global average temperatures rise above 1,5°C, as they provide decarbonization pathways for rapid, deep and sustained emission reductions.

The selected sectoral net zero pathways shall provide GHG emission reduction pathways and may include relevant physical intensity pathways that, when used for setting targets, contribute to conserving the global carbon budget.

If more than one pathway exists that meets the criteria above for the same sector and location, the organization shall choose one pathway and explain why this pathway is appropriate for the organization rather than other eligible pathways.

In the absence of any independent net zero pathways relevant for the organization, the organization may use a sectoral pathway from its respective industry association, as long as that pathway fulfils the list of net zero pathway requirements described in this clause. Organizations using such pathways should provide additional justification demonstrating independence and adherence to climate science.

If none of the available net zero pathways are appropriate, the organization shall explain why this is the case.

When no such relevant sectoral net zero pathway exists, or none is appropriate, the organization may use a global average net zero pathway or follow the method outlined in Annex E .

The organization shall apply peer-reiewed allocation methodologies to translate the selected pathway to an organizational net zero pathway and disclose how these are applied.

NOTE 6 Examples of allocation methodologies include the absolute reduction approach or Sectoral Decarbonisation Approach in Annex G .

Organizations shall set GHG emission reduction targets based on net zero pathways from 2020 as the pathway base year. If a selected net zero pathway has a base year later than 2020, then cumulative global GHG emissions since 2020 shall be subtracted from the global carbon budget underlying this pathway.

Requirements in clauses 10.1 and 10.2 apply to target-setting for emissions across Scopes 1, 2 and 3, in addition to the following specific requirements for emissions in each Scope, outlined in clause 10.4 for Scope 1, clause 10.5 for Scope 2 and clause 10.6 for Scope 3.

10.3 Feasibility test for residual emissions

An organization’s anticipated residual emissions are initially derived “top-down” from its selected GHG emissions reduction pathways. At net zero, residual emissions are determined “bottom up” as those emissions which literally cannot be eliminated.

As the organization works towards its net zero target, if it anticipates residual emissions greater than those determined by its selected net zero pathway , it shall carry out a feasibility analysis.

If its residual emissions are anticipated to be greater than those determined by its sectoral net zero pathway the organization shall document and publicly report the outcome of the feasibility analysis, and the basis for its conclusions.

This feasibility analysis report shall explain and justify why the organization does not expect to be able to further reduce GHG emissions by the net zero target date, and includes:

a) how the anticipated volume of residual emissions compares to residual emissions estimated by the organization's net zero pathway and why the organization’s context differs from that pathway;

b) why reduction options for significant anticipated residual emissions sources are considered infeasible, i.e. for technical or economic reasons.

    1) Technical: A survey of technical solutions available at scale to reduce GHG emissions and a cost benefit analysis for these at the net zero target date, compared to the cost of durable carbon dioxide removals to counterbalance those emissions.

2) Economic: An explanation of why the organization's financial resources (e.g.income statement demonstrating losses) are not sufficient for reducing residual emissions further.

c) how the organization's net zero pathway aligns with the equity and justice principle (4.9).

If the organization can justify why it is deviating from its net zero pathway , it shall restate the volume of anticipated residual emissions, revise its transition plan, and adjust its carbon dioxide removal trajectory and removals milestones (see clause 12.2) to prepare for counterbalancing the new volume of residual emissions.

Appropriate documented information shall be available as evidence of the selection of pathway, and the establishment of targets and indicators, as required in clauses 10.1 , 10.2 , 10.4 , 10.5 and 10.6, and to justify their selection.

10.4 Direct greenhouse gas emissions/Scope 1 emissions targets

Organizations shall set GHG emission reduction targets for direct GHG emissions/Scope 1 emissions based on the net zero pathway selected to fulfil the requirements of clause 10.2 above.

NOTE 1 Annex E describes net zero pathways based on a 600 gigaton (Gt) CO_2 global carbon budget and the IEA NZE model [28] , where an additional budget is added for organizations operating in emerging economies that have national net zero target dates beyond 2050. A global carbon budget of 600 Gt CO_2 from 2020 corresponds to limiting peak warming to approximately 1,6°C above pre-industrial levels with 50% probability. For a 50% probability, the expected temperature rise ΔT can be calculated from the global carbon budget B using

$$\Delta T = 1,207(℃) + 0,000587\ (℃ / Gt) * B$$

(The underlying data, modified as described above, corresponds to IPCC AR6 WG1, Table SPM2 [35])

The organization shall establish organizational GHG budget(s) for its interim targets and its net zero target for its direct/scope 1 emissions using peer-reviewed allocation methods (see pathways and budgets for sectors with significant CO_2 emissions in Annex E). The organization's cumulative GHG emissions between base year and target year shall be equal to or less than the organization's GHG budget. See examples in Annex G .

NOTE 2 Peer-reviewed allocation methods assign global, sectoral or national carbon budgets (which may be implied from net zero pathways) directly to organizations.

The organization may apply other peer-reviewed methods for selecting their pathway that result in similar or lower cumulative GHG emissions for the organization than the organizational GHG budgets defined above.

Organizations should use peer-reviewed methods to compare the global carbon budget of the two pathways. If more than one method exists, the organization shall explain their choice.

NOTE 3 The IEA NZE model [28], for example, has a target setting year of 2020 and provides a sectoral breakdown of emission reduction pathways, so an organization aligning to these would set a 2020 base year . Accounting for organization's emissions to date in line with sectoral pathways helps to avoid overshoot of the global carbon budget

Figure 4 below illustrates the timeline for the pathway and its relation to the timeline of organization's targets.

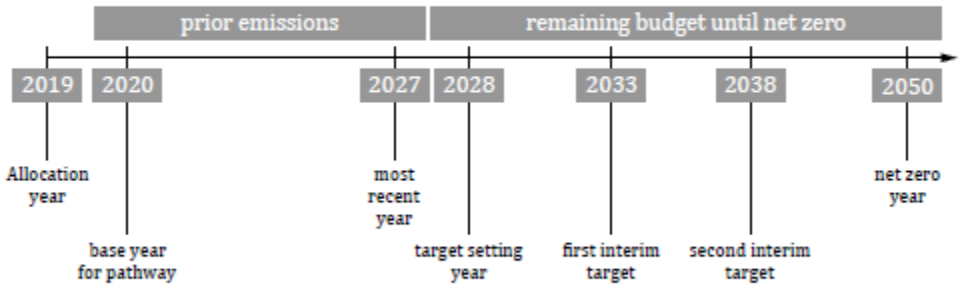


Figure 4 — Framework showing the steps to be taken by organizations

When setting targets the organization should:

— consider the lifetime of their assets to prevent "locked in emissions," or potential stranding of its assets, or both; and

— take into account national decarbonization pathways developed for the countries in which it operates.

Organizations having material direct GHG emissions of methane, nitrous oxide or HFCs in their direct GHG emissions /Scope 1 emissions should set separate methane, nitrous oxide and HFC reduction targets that each reflect high ambition for reductions. Decarbonization pathways for these GHGs should be converted to CO_2 equivalents and the resulting budget should be added to the CO_2 reduction pathway that has been determined on the basis of Annex D .

NOTE 4 Details of pathways for reduction of methane, nitrous oxide and other HFC gases can be found in Annex F .

10.5 Energy indirect greenhouse gas emissions/Scope 2 emissions targets

The organization shall set a long-term target for all its energy indirect GHG emissions/Scope 2 emissions using the location-based approach described in ISO 14064-1:2018 or the GHGP Scope 2 Guidance (2015) [10] for quantification.

The organization shall set interim targets for consuming low carbon energy for its operations across the locations where it consumes imported energy.

NOTE 1 These targets are for the total aggregated amount of imported low carbon energy an organization consumes.

When setting interim targets for consuming or supporting low carbon energy deployment, the organization may use the market-based approach.

When using the market-based approach in setting interim targets for energy indirect GHG emissions/ scope 2 emissions the organization shall follow the quality and integrity requirements for contractual instruments and market-based mechanisms in the selected GHG quantification and reporting standard (ISO 14064-1:2018 or the equivalent GHGP standards).

If pathways for the electricity sector that fit the criteria in clause 10.2 are not appropriate or available for the organization , then the organization may use Annex G pathways for the electricity sector (noted as power sector in Annex G) for its indirect energy GHG emissions /scope 2 emissions reduction targets.

NOTE 2 Targets for consuming low carbon energy can be set following science-based pathways for low carbon energy deployment, and taking account of regional context. For example: an organization states that it aims to purchase 30% by 2030 and 70% by 2040 of its imported energy from low carbon energy sources using contractual instruments such as power purchase agreements supported by transferable instrument entitling claims that give them unique ownership of a certain volume of energy.

10.6 Other indirect GHG emissions targets/Scope 3 emissions targets

10.6.1 General

The organization shall include all other indirect GHG emissions/Scope 3 emissions in its long term net zero pathway and net zero target.

The organization shall set interim GHG emissions reduction targets to address significant other indirect GHG emissions/Scope 3 emissions.

To support the delivery of other indirect GHG emission /scope 3 emission reduction targets, the organization should additionally set activity targets (see clause 10.7) to address other indirect GHG emissions/ Scope 3 emissions.

10.6.2 Determining significant other indirect GHG emissions/Scope 3 emissions

The following significance criteria shall be applied to determine the other indirect GHG emissions/ Scope 3 in the inventory for which targets will be set:

— Primary criteria:

  — Magnitude: the indirect emissions/Scope 3 emissions that are determined to be quantitatively substantial, as demonstrated by a published method or threshold used to define magnitude;

    NOTE 1 An example of a threshold that can be used to define significant magnitude is a percentage of total Scope 3 emissions.

  and

  — Influence: the emissions that the organization has the ability to influence, monitor, or help to reduce, including, at a minimum, other indirect emissions/Scope 3 emissions from suppliers and other organizations with which they have a contractual or other commercial relationship.

  NOTE 2 The degree of influence an organization has over its indirect emissions varies, depending on factors such as its size, sector, purchasing power and position with the value chain , which determine its level of leverage.

— Secondary criteria:

  — Risk and opportunity: the other indirect emissions/Scope 3 emissions that expose the organization to physical and transition risks or create opportunities for business;

  — Sector-specific guidance: the other indirect emissions/Scope 3 emissions deemed significant in sector-specific guidance;

  — Outsourcing: the other indirect emissions/Scope 3 emissions resulting from outsourced activities; and

  — Employee generated: substantial employee emissions that the organization can influence (e.g. business travel, commuting).

NOTE 3 These criteria are not intended to be used to determine which emissions to include in the other indirect emissions/Scope 3 inventory.

The organization shall establish and explain the qualitative and quantitative thresholds used to assess which emissions are significant across these criteria (see Figure 5 below).

The organization shall set interim GHG emissions reduction and net zero targets for any other indirect GHG emissions /Scope 3 emissions if emissions are significant due to:

— Higher magnitude and higher influence;

— Higher magnitude or higher influence, and one or more of the secondary criteria.

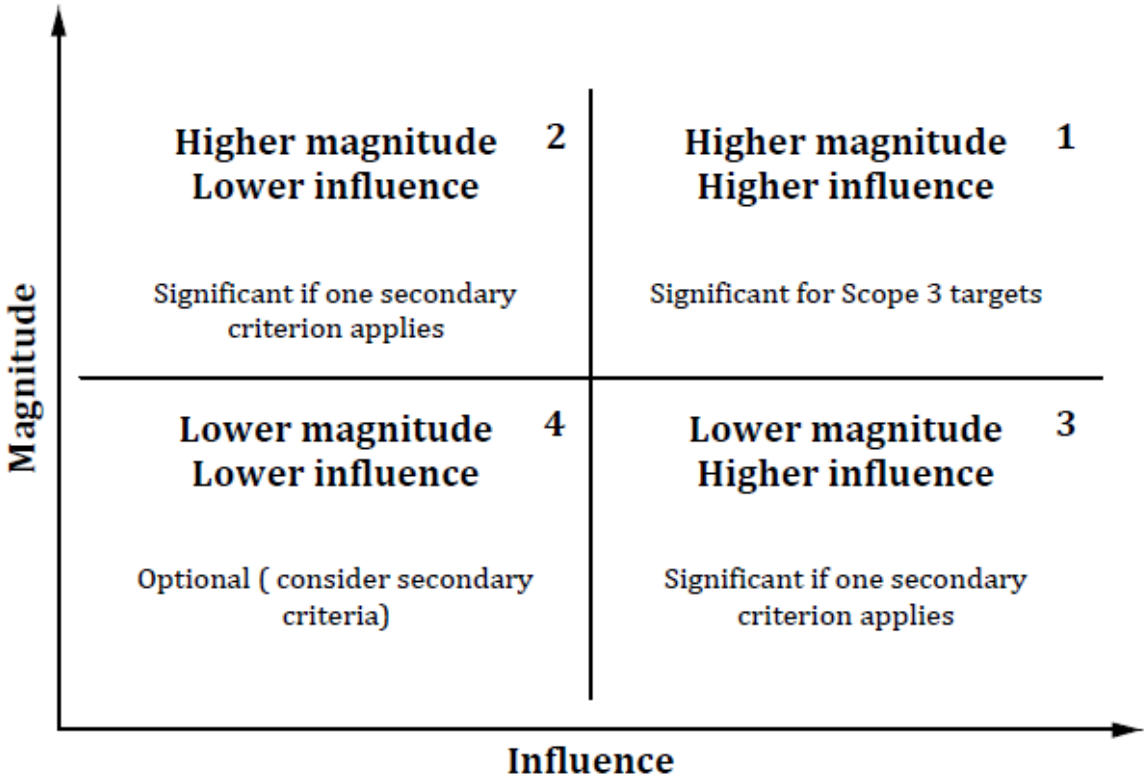


Figure 5 — Application of the other indirect emissions/Scope 3 emissions significance criteria.

The following shall be taken into account:

— Higher magnitude, higher influence emissions are significant for Scope 3 GHG emissions targets. (Box 1)

— Higher magnitude, lower influence emissions are significant for Scope 3 GHG emissions targets if one or more of the secondary significance criteria applies. (Box 2)

— Lower magnitude, higher influence emissions are significant for Scope 3 GHG emissions targets if one or more of the secondary significance criteria applies. (Box 3)

— Lower magnitude, lower influence emissions are optional for Scope 3 GHG emissions targets, though secondary significance criteria should still be considered. (Box 4)

The organization shall review periodically its significance criteria thresholds to determine if these need to be changed, for example as a result of developments in sector-specific guidance or stakeholder expectations.

The organization shall review at planned intervals the significance of its other indirect GHG emissions/ Scope 3 emissions and when any changes are made to its significance criteria thresholds.

The organization shall maintain as documented information its significance criteria thresholds and the results of its determination of significance of its other indirect GHG emissions/Scope 3 emissions.

The organization shall publicly disclose the proportion of other indirect GHG emissions /Scope 3 emissions in its inventory that it has excluded from its target-setting and its justification for these exclusions, based on its significance criteria.

When an organization excludes emission sources with higher influence or higher magnitude (Box 2 or 3) on the basis of the significance assessment, it shall nonetheless plan activities and set activity targets to take appropriate mitigation actions to address these emissions (including actions taken for global net zero , see clause 11.3). This may include instances in which influence is diluted, but by collaborating with relevant stakeholders, the organization can change the system in which its value chain operates.

10.7 Activity targets

In addition to setting GHG emissions reduction targets, setting activity targets helps organizations in implementing measures to achieve those emissions reduction targets.

The organization shall set targets to improve energy efficiency.

NOTE 1 Examples of energy efficiency measures include optimizing operations, reducing energy losses, upgrading technology and improving the energy efficiency of its products. ISO 50001:2018 [36] can be used to enhance energy efficiency.

The organization shall set targets to transition away from the use of, support for and investment in fossil fuels.

If its operations or supply chain activities include land use or land use change, the organization shall:

a) ensure no deforestation in own operations; and

b) assess the risks of deforestation or other ecosystem conversion (that exacerbates climate change) in its supply chain.

For b) the organization shall take appropriate action to avoid or mitigate any significant risks.

The organization should also set targets that support nature conservation and restoration activities with verified outcomes.

If purchased or sold goods and services are significant sources of GHG emissions, the organization should set an activity target to address those emissions, such as a supplier engagement or alignment target (e.g. increased share of purchased volume from suppliers with a net zero target).

NOTE 2 Guidance on developing and achieving supplier engagement targets can be found in "Engaging Supply Chains on the Decarbonization Journey" v1.1, published by the Science-based Targets Initiative July 2025 [37].

Indicators that measure impacts of engagement include "number of additional suppliers setting targets" or "reduction in supplier emissions intensity attributed to the organization's intervention."

Activity targets for addressing other indirect emissions/Scope 3 emissions can include volume or product alignment targets that increase the share of commodities or products aligned with science-based benchmarks (for example, more deliveries by electric vehicles or percentage of key supplier energy from low-carbon sources).

The organization should set targets for planned actions to contribute to global net zero (see clause 11.3), such as targets to sell products and services that produce climate benefits, to retire high-quality removal and reduction carbon credits, to use other market mechanisms, and to undertake policy engagement and partnerships that support climate action.

10.8 Indicators

The organization shall select and establish indicators to provide the necessary data for managing and reporting progress towards net zero, in accordance with Clause 14.

The organization shall select quantifiable indicators that minimize uncertainty and yield accurate, consistent and verifiable results, taking into account technical feasibility.

11 Net zero action

11.1 Greenhouse gas mitigation action

The organization shall implement the actions in its transition plan.

The organization shall not delay taking action to reduce GHG emissions due to incomplete data or measurement and it shall take actions likely to reduce GHG emissions based on estimates while it works to improve quantification.

The organization shall demonstrate improved energy efficiency, for example by optimizing operations, reducing energy losses and upgrading technology.

The organization should demonstrate GHG emissions reductions through enablers of decarbonisation of the energy system across the locations where it consumes purchased energy or where its products consume energy.

EXAMPLE Enablers of decarbonisation of the energy system include procurement of low carbon energy supported by renewable energy certificates or environmental product declarations.

The organization shall educate and empower employees as appropriate to integrate climate and related sustainability aims into processes, decisions and daily work.

To reduce other indirect GHG emissions /Scope 3 emissions the organization shall improve relevant products and services to reduce GHG emissions from their use, to enable the circular flow of resources (e.g. sharing, repairing, re-manufacturing and recycling products and materials), and to enable sustainable lifestyles and purchase decisions by customers.

Organizations that provide professional services shall integrate serviced emissions targets into new contracts and should attempt to update existing contracts in line with their net zero targets.

NOTE The Race to Zero's report "Catalysing climate action : The role of professional service providers in realizing a net-zero future" [38] provides more information on serviced emissions .

The organization should engage and collaborate with suppliers, customers and other organizations to determine actions to address indirect GHG emissions.

The organization should improve material efficiency, where this reduces life cycle GHG emissions.

Examples of other GHG mitigation actions are provided in Annex C.

Appropriate documented information shall be available as evidence of GHG mitigation action.

11.2 Action for scaling low carbon solutions

11.2.1 General

The organization may consider the purchase of environmental commodity certificates with regard to emissions associated with its value chain , which it is not able to trace, directly address, or influence.

There are instances where environmental commodity certificates are used to trace the physical transfer of the underlying commodity, and there are also instances where environmental commodity certificates are

disconnected from the underlying commodity. This section refers to the use of environmental commodity certificates which are disconnected from the underlying commodity.

In accordance with the mitigation hierarchy, the use of environmental commodity certificates shall not be a substitute for reduction of the GHG emissions in the organization's GHG inventory, as specified in an organization's transition plan.

11.2.2 Objective and Intention

The purpose of purchasing/using these environmental commodity certificates is to accelerate the scaling and adoption of low carbon products and technologies which are not currently widely available or accessible for direct procurement, but which are required as part of an organization's net zero pathway .

When purchasing and reporting on use of environmental commodity certificates , the organization shall explain its barriers to accessing low carbon products and technologies that are addressed with the environmental commodity certificates, and the ways in which the organization views these ECCs as contributing to increasing global supply for direct procurement and enhanced long-term traceability.

As the adoption of a low carbon commodity scales environmental commodity certificates may no longer be additional, needed, or appropriate to use, in that market.

11.2.3 Link between greenhouse gas emissions sources and environmental commodity certificates

The use of environmental commodity certificates should be associated with an equivalent type and volume of GHG emissions source within the organization’s GHG inventory .

Any environmental commodity certificates should be associated with the same region as the one in which the organization's related emissions arise.

11.2.4 Quality criteria and frameworks

The organization should make use of existing best practice frameworks and methodologies to evaluate these environmental commodity certificates, prioritizing transparency, robust quantification, and avoidance of double-counting. If environmental commodity certificates are claimed as part of an external programme or standard, this shall be described.

The organization shall avoid lock-in of high-emission technologies and deforestation . The organization shall follow the principle of avoiding adverse impacts (4.7)

11.2.5 Accounting and reporting

An organization using and purchasing environmental commodity certificates shall maintain separate accounting and reporting for the environmental commodity certificates, distinct from its physical emissions accounting, as set out in [GHG-P and ISO 14064-1:2018].

If an organization purchases environmental commodity certificates, it shall state why it was practically unable to procure the underlying lower-emission products directly.

11.3 Taking action for global net zero

11.3.1 General

In addition to immediate action to reduce the organization’s GHG emissions (as per clause 11.1 above) and to enhance removals, the following sub-clauses outline efforts towards global net zero across an organization’s spheres of influence, including through its products, climate finance portfolio, and policy public engagement.

11.3.2 Climate solutions products and services

Organizations with potential to develop products and services that accelerate the transition to global net zero by enabling others to reduce GHG emissions (i.e. climate solutions) shall determine and implement appropriate actions.

The organization shall provide justification if it determines none of its products or services are relevant to the net zero transition. If the organization determines that none of its products or services are relevant to the net zero transition, its justification may be qualitative.

NOTE 1 Examples of guidance on identifying climate solutions include Project Drawdown, the Climate Solutions Framework developed by the Exponential Roadmap Initiative and Oxford Net Zero [39], IIGCC's Net Zero Investment Framework[40] and the Race to Zero 2030 Breakthroughs [41].

If the organization estimates avoided emissions (e.g. through climate solutions from innovations in products and services) and sets targets for avoided emissions, these avoided emissions shall be reported separately from estimates of reductions in direct GHG emissions /Scope 1 emissions,energy indirect GHG emissions / Scope 2 emission, and other indirect GHG emissions /Scope 3 emissions.

Organizations should:

a) identify opportunities within the organization's business model and capabilities to develop climate solutions products and services that accelerate global decarbonization by enabling others to reduce GHG emissions;

b) demonstrate increasing investment in research and development of climate solutions;

c) incentivize innovation by educating and empowering employees to pitch ideas for climate solutions to management; and

d) promote customer update of climate solutions and encourage sustainable lifestyles through targeted communication and marketing.

If quantifying expected avoided emissions from the sale or provision of the organization's climate solutions, estimates shall be based on life cycle assessments of both the new solution and a robust counterfactual scenario. The organization shall disclose all methodology, assumptions, and external inputs used in their estimates. The organization should monitor actual impact to ensure the credibility and quality of their estimates.

NOTE 2 Examples of relevant guidance on defining, assessing and reporting avoided emissions are ISO's sector-specific standard (e.g. ISO 13391-1:2025 [42] *Wood and wood-based products Greenhouse gas dynamics Part 1: Framework for value chain calculations*) and WBCSD's "Guidance on Avoided Emissions Helping Businesses Drive Innovations and Scale Solutions Towards Net Zero" [43] .

Service providers should develop strategies and solutions to address the potential climate impacts of their services, advice, or advertising, beyond their quantified other indirect GHG emissions /Scope 3 emissions.

NOTE 3 An example of additional guidance for providers of professional services is The Race to Zero's report "Catalysing climate action : The role of professional service providers in realizing a net-zero future" [38] .

11.3.3 Portfolio of climate finance

The organization shall allocate finance for climate action and disclose its value relative to its remaining annual GHG emissions, alongside the rationale for this allocation. The organization can allocate this finance by applying an internal carbon fee to a proportion of remaining GHG emissions (aiming at covering 100% of remaining GHG emissions).

NOTE 1 The Science Based Targets initiative, Carbon Gap and Gold Standard offer guidance on different approaches for setting an internal carbon fee, including social cost of carbon concepts.

The organization should use its climate finance portfolio to finance activities that deliver high-integrity climate mitigation, with measurable GHG mitigation outcomes, estimated in CO_2e, taking account of the mitigation hierarchy (see clause 5.2). These activities should be additional.

Organizations shall demonstrate that any such activities are of high quality and include sustainable development safeguards and benefits.

These activities can include different types of decarbonization initiatives or local community climate projects and activities in or outside their value chain. These can be financed through capital or other market mechanisms, such as removal and reduction carbon credits, either through direct project investment, purchase and retirement of existing credits, or off-take agreements.

NOTE 2 Further guidance on this approach can be found in Gold Standard's BVCM paper [44], SBTi's BVCM paper [45], WBCSD's Beyond Value Chain Action paper [46] and WWF Switzerland's white paper Climate Contributions for People and Nature. [47]. The VCMI Claims Code of Practice, Version 3.1 can be used as a reference document for different emission responsibility levels for beyond value chain mitigation.

NOTE 3 One approach that could deliver such benefits is organizations deciding to become carbon neutral (based on ISO 14068-1:2023 [12]) on their way to organizational net-zero, as this would drive financial flows towards emissions reduction and removal activities in the near term without jeopardising their organizational net-zero objectives.

The organization should measure and transparently report the impact and origins of the initiatives in its climate finance portfolio, following the relevant available best practice on measurement, reporting and verification. The CO_2e impacts should be verified.

Any quantified impacts of the organization's climate finance portfolio beyond the value chain shall be reported and accounted for separately from actions taken within the organization's GHG inventory boundary..

NOTE 4 ISO 14064-2:2019 [5] specifies principles and requirements at the project level for quantification, monitoring and reporting of GHG emission reductions or removal enhancements. ISO 14064-3:2019 [6] specifies GHG Validation and Verification requirements and provides guidance for verifying and validating GHG statements.

NOTE 5 ISO 14068-1:2023 [12] Clause 11.2 sets out criteria to demonstrate that carbon credits are high-quality. Standards and guidelines for high-quality carbon credits are also being developed by a number of voluntary, national and supranational bodies. Examples include the Integrity Council for the Voluntary Carbon Market's (ICVCM) Core Carbon Principles[48], the International Civil Aviation Organizations' Carbon Offsetting and Reduction Scheme for International Aviation, ICROA and Article 6.4 of the Paris Agreement[2].

11.3.4 Policy engagement

If an organization engages in policy or public advocacy relevant to climate action, either directly or indirectly, including through associations (e.g. trade associations, alliances, coalitions, lobbyists, charities and think tanks), it shall work to align these with a global transition in line with the goals of the Paris Agreement[2], its own net zero target and the policies needed to achieve it.

NOTE 1 Examples of further guidance on net zero aligned policy engagement can be found in the High Level Expert Group's Integrity Matters report (chapter 6) [3] , We Mean Business Coalition's Framework for Responsible Policy Engagement [49] , AAA Framework for Climate Policy Leadership's Business Case[50] and Race to Zero's 5th P (Persuade) Handbook [51] and CAFA's Best Practice Framework for Associations[52].

Capability allowing, the organization should:

a) identify the existing policies in applicable jurisdictions that it may be able to directly or indirectly influence, and that are relevant to its transition plan targets, support and accelerate activities for a just transition to global net zero and minimize negative impacts and maximize opportunities for stakeholders affected by the organization's transition actions;

b) determine the need for additional policies, regulations and public programmes to support alignment of these objectives;

c) determine the public sector bodies and industry partnerships and organizations it can support and work with to amplify the impacts of its policy engagement;

d) take action to advocate for net zero aligned policy by directly engaging with local and national policymakers, and industry counterparts and partners, on the policy dependencies of its transition plan and for appropriate policies and regulations and public programmes to support and accelerate activities

for a just transition to global net zero and minimize negative impacts and maximize opportunities for stakeholders affected by the organization's transition actions; and

e) disclose its membership of any trade association or similar organizations and any contrary policy positions of those entities.

NOTE 2 Industry counterparts and partners can include industry associations, professional service providers, customers, clients, suppliers, and employees.

11.3.5 Sustainable development goals

A net zero aligned organization shall consider how its planned net zero actions align with the United Nations Sustainable Development Goals (SDGs) [53] and with the United Nations Guiding Principles on Business and Human Rights [54], by addressing, where relevant, environmental and social issues such as:

a) mitigating and preventing harm to the environment and ecosystems from its climate actions;

b) supporting and enhancing biodiversity;

NOTE 1 ISO 17298:2025 [55] on Biodiversity provides requirements and guidelines to strenghten consideration of nature and biodiversity in the strategy and operations of organizations.

c) supporting conservation, restoration and protection of natural and semi-natural ecosystems in their own right and maintaining the services these provide to people and communities;

d) contributing to the preservation and restoration of natural GHG sinks (e.g. forests, soils, wetlands);

e) eliminating deforestation ;

f) taking measures for the conservation and protection of water, oceans and natural resources; and

g) enhancing social well-being including improving prosperity, eliminating poverty, and respecting human rights.

NOTE 2 Recommendations on target-setting, actions and reporting of wider impacts on nature are provided by the Task Force on Nature-related Financial Disclosures [56] and Science Based Targets for Nature [57] .

NOTE 3 For guidance on contributing to the Sustainable Development Goals (SDGs) seeISO/UNDP PAS 53002:2024 [58] Guidelines for contributing to the United Nations SDGs

11.3.6 Empowerment of workers and communities potentially affected by the transition

In applying the principle of equity and justice (see 4.9) in empowering workers and communities potentially affected by the transition the organization shall:

— anticipate, assess and address stakeholder risks and opportunities arising from all climate actions;

— engage affected stakeholders , including under-represented groups, transparently and inclusively in transition planning, decision-making and implementation;

NOTE ISO 26000:2010 [59] provides specific guidance on how different vulnerable groups can be effectively engaged.

— support decent, sustainable, and inclusive work across existing and emerging supply chains (e.g. by enabling access to reskilling, social protection, and economic opportunity and transition to new jobs for workers, including those most marginalized);

— balance trade-offs, while respecting human rights, including the right of Indigenous Peoples' to Free Prior and Informed Consent where their lands, territories and resources are impacted;

— provide remediation processes for adverse social and environmental impacts caused or contributed to by climate mitigation action and support the participation of affected groups;

— facilitate access to financial support for individuals and groups affected by the organization's GHG mitigation actions; and

— periodically review how actions taken affect the just transition (e.g. on labour, public acceptance, resources).

12 Counterbalancing residual emissions

12.1 General

To achieve organizational net zero, once the organization has met its net zero GHG emissions reduction target, it shall counterbalance its residual emissions using high quality durable carbon dioxide removals that are equivalent to or greater than its residual emissions.

To enable counterbalancing of its residual emissions at its net zero date and yearly thereafter, the organization shall, during its transition to net zero:

a) calculate its anticipated residual emissions and define a trajectory and milestones to ensure it can reach the quantity, quality and durability of carbon dioxide removals it needs to meet its net zero target;

b) report progress towards its removal milestones (see clause 12.2) separately from its progress towards interim and net zero GHG emission reduction targets; and

c) maintain and retain documented information demonstrating that the requirements of clauses 12.1, 12.2, 12.3 and 12.4 have been fulfilled.

Organizations can use carbon dioxide removals within their organizational boundaries or carbon dioxide removal credits outside their organizational boundaries, as long as they satisfy the quality criteria (see clause 12.4).

The organization shall not use emission reduction or avoidance credits for counterbalancing residual emissions.

12.2 Preparing to counterbalance before net zero

The volume of residual emissions cannot be precisely determined years in advance of an organization's net zero target date. Nonetheless, an organization’s net-zero pathway, based on credible climate science, provides an estimation of anticipated residual emissions (see Clause 10).

The organization shall:

— determine its anticipated residual emissions at net zero, as whatever emissions remain once its net zero GHG emission reduction target is achieved;

— review its anticipated residual emissions at least during each update of its transition plan; and

— set milestones for carbon dioxide removals in line with interim reduction targets, starting no later than 5 years after setting targets.

NOTE The purpose of these removals milestones is to prepare the organization for full counterbalancing at its net zero target date, given the need to scale up capacity for high-quality durable removals over time. During this time, organizations should use and help develop risk management mechanisms, such as buffer pools, insurance, risk metrics and bundled removals, developed by public registries and other credible bodies, to develop the capacity in all countries to address both reversal and delivery risks.

Each organization may shape its removal milestones to reflect its broader strategy, but the trajectory for carbon dioxide removals shall demonstrate a path to full counterbalancing at net zero.

In setting its removals milestones, the organization shall consider:

— opportunities to integrate carbon dioxide removals into its own operations;

— working with suppliers to incorporate carbon dioxide removals into the value chain ;

— building a portfolio of carbon dioxide removal credits to support market development, manage risk, and scale up removals capacity and durability over time; and

— increasing the share of higher durability carbon dioxide removals at each milestone.

A balanced portfolio should combine:

— ex-post carbon dioxide removal credits, for which the underlying activities have been completed, and the credits have been delivered and retired no more than 2 years from issuance;

— advance off-take agreements to support the scale-up of new removals technologies and secure access to future supply;

— technological removals that have low reversal risk but potentially higher delivery risk due to the early stage of scale-up; and

— nature-based carbon dioxide removals that potentially have higher reversal risk but tend to have lower delivery risk and a wide range of co-benefits for nature and people.

Depending on the organization, examples of different initial milestone strategies include:

a) setting the initial milestone at the level of its anticipated residual direct/Scope 1 emissions before expanding to residual indirect emissions;

b) investing in a feasibility study and pilot testing for incorporating carbon dioxide removals into operations;

c) working with suppliers to help them incorporate carbon dioxide removals into their operations;

d) defining a trajectory to increase the share of anticipated residual emissions counterbalanced over time towards eventually counterbalancing all residual emissions by the organization's net-zero target date;

e) addressing all anticipated residual emissions each reporting period from the outset; and

f) using a carbon fee levied on all business travel to build a balanced removals portfolio.

12.3 Counterbalancing at organizational net zero

To reach organizational net zero the organization shall:

a) demonstrate that its residual emissions at net zero are consistent with the selected sectoral pathway, justifying any differences (see clause 10.7)

b) counterbalance residual emissions only with durable carbon dioxide removals (see clause 12.4), including removal credits beyond the organizational boundary ;

c) ensure that carbon dioxide removals used to counterbalance residual emissions meet the required quality standards on effectiveness and integrity (see clause 12.4);

To maintain the state of organizational net zero , the organization shall:

— continue to counterbalance its residual emissions yearly; and

— ensure that it remains at least at net zero or achieves net negative GHG emissions .

Organizations should aim to continually reduce residual emissions after reaching organizational net zero , through further innovation and transformation.

12.4 Quality criteria for carbon dioxide removals

12.4.1 General

The organization shall ensure that carbon dioxide removals , whether nature- or technology-based are:

a) durable (see 12.4.2)

b) additional (see 12.4.3)

c) quantified (see 12.4.4)

d) not causing carbon leakage (see 12.4.5)

e) not counted, used or claimed by more than one organization (see 12.4.6) and

f) accounted for in a credible way (see 12.4.7).

To protect social and environmental integrity, the organization shall identify, evaluate and reduce harms and risks that could arise from its removal activities, and take reasonable actions to ensure the carbon dioxide removals activities it governs, invests in or purchases and retires credits from adhere to the principles laid out in Clause 4 of this Standard.

NOTE Standards and guidelines for high-quality carbon dioxide removal credits are being developed by a number of voluntary, national, supranational and commercial bodies. Examples include the Integrity Council for the Voluntary Carbon Market's (ICVCM) Core Carbon Principles, Article 6.4 (Paris Agreement) Supervisory Body, the EU Carbon Removals and Carbon Farming (CRCF) Regulation [60] (EU/2024/3012), and ratings agencies.

12.4.2 Durable

The organization shall ensure that carbon dioxide removals are durable, which means the reversal risks inherent to the specific carbon storage mechanism shall have been assessed and addressed through a robust monitoring and remediation programme.

Before reaching organizational net zero the organization shall identify and quantify the risk of reversals, and it shall use risk management mechanisms designed to address these, where appropriate.

For the purpose of counterbalancing residual emissions at net zero:

— The removal /storage type shall be expected to have a durability of at least 100 years;

— If physical duration is expected to be less than 100 years, risk management mechanisms may be used to ensure the 100-year storage requirement is met.

12.4.3 Additional

The organization shall ensure that carbon dioxide removals are additional, meaning the carbon dioxide removal would not have happened in the absence of the specific investment or project.

12.4.4 Quantified

The organization shall ensure that carbon dioxide removals are quantified using relevant standards and methodologies, which are science-based and independently developed and validated. All upstream and downstream GHG direct and indirect emissions associated with and resulting from the process to remove and store carbon shall be estimated and accounted for and subtracted from the total removals calculated. Prior to issuance of a carbon credit, verification by a relevant accredited body is required.

NOTE Guidelines to assess cradle to grave GHG emissions in product systems can be found in ISO 14067:2018 [7] and guidelines to assess emissions and removals in projects can be found in ISO 14064-2 (2019).

12.4.5 Not causing carbon leakage

The organization shall ensure that carbon dioxide removals do not cause carbon leakage, which means addressing the risk that carbon dioxide removals lead to a consequent rise in GHG emissions in other locations.

12.4.6 Not counted, used or claimed by more than one organization

The organization shall ensure that carbon dioxide removals are not counted, used or claimed by more than one organization. Specifically:

— carbon dioxide removals within the organizational boundary have not been used to make organizational mitigation claims or sold to third parties;

— carbon dioxide removals that are passed through products within the value chain must be allocated to organizations using chain-of-custody tracking;

— carbon dioxide removal credits are retired in a recognized public registry to ensure there has only been one single use.

It is not a requirement for organizations to purchase removal credits with corresponding adjustments, but they should disclose whether the credits use corresponding adjustments or not. Where applicable, organizations should disclose where removals also contribute to their country's NDC.

12.4.7 Accounted for in a credible way

The organization shall ensure that carbon dioxide removals are accounted for using measurements and methodologies that have been independently verified by a competent person or party.

13 Monitoring, improvement and adjustment

13.1 Monitoring progress

The organization shall regularly monitor its GHG emissions in comparison to the base year GHG emissions inventory, its removals, and its progress on other target metrics to assess its performance and identify changes needed, if applicable.

When complete or specific GHG emissions data for tracking progress against GHG emissions targets are not available, the organization should first identify actions likely to reduce GHG emissions and then identify proxy metrics that can be used to track these actions.

The organization shall determine its GHG inventory and the degree to which it is aligned with the organization's net zero pathway , and identify any gaps between the inventory and the selected pathway (i.e. under-performance or over performance).

The frequency of monitoring shall be sufficient to:

a) meet the requirements for reporting and disclosure; and

b) provide timely information on its performance, so that the need for any further action to meet targets can be determined.

13.2 Continual improvement

The organization shall determine periodically opportunities for improvement and consider taking action to support and accelerate the speed or extent of:

a) achieving organizational net zero;

b) investments in interventions that accelerate GHG mitigation both within and beyond its value chain ; and

c) supporting the preservation and restoration of natural GHG sinks.

The organization shall monitor changes to net zero pathways, including relevant sector-specific pathways. The organization shall take into account emerging scientific evidence, best practice and external and internal lessons learned.

The organization shall maintain documented information as evidence of conformance with 13.1 and 13.2.

13.3 Adjustment

The organization shall make updates to the organization's GHG emission reductions and removals targets, and plans to achieve these targets, taking into account any gap arising from its climate underperformance. These measures shall ensure that the organization is able to meet its net zero targets.

14 Reporting

14.1 General

The organization shall implement processes to ensure complete, consistent, accurate, relevant and transparent communication and public reporting of target-setting, planning, progress towards and achievement of net zero.

The organization shall report on all applicable items.

The organization shall report publicly on qualitative and quantitative progress against targets at least annually. If appropriate, the organization may report in line with accepted financial reporting time frames, as long as these are annually or more frequent.

NOTE 1 The reporting period may be other than the calendar year, for example to align with the organization's financial reporting period.

Organizations may report on net zero progress using other reporting standards and schemes, provided all requirements of this clause are met.

NOTE 2 IFRS S2 Climate-related Disclosures sets out the requirements for disclosing information about an entity's climate-related risks and opportunities and is a recognised framework for this purpose.

Appropriate documented information shall be available as evidence that the requirements of clauses 14.1, 14.2, 14.3 and 14.4 have been fulfilled.

14.2 Scope of annual reporting and information

The organization shall include the following when reporting its net zero aligned status:

a) scope of reporting, including the organization and the person(s) or entity responsible for the report;

b) the reporting time period, including the base year and interim and net zero target years;

c) the GHG quantification standard used (see 8.1 for standards to be used);

d) the GHG inventory boundary;

e) the most recent GHG inventory;, including

   1) separate reporting of GHG emissions and removals that have occurred within the inventory boundary; and

2) reporting of Scope 2 emissions using both location-based and market-based approaches;

f) the proportion of other indirect GHG emissions/Scope 3 emissions in its inventory that has been excluded from its target-setting and its justification for these exclusions;

g) details of validation or verification activities and results;

h) descriptions of any planned new initiatives or actions and their expected future impacts;

i) details of any assessments of wider social and environmental impacts during the reporting period;

j) details of any climate change policy advocacy activities, whether direct or indirect; and

k) if any, details of any previously published reports and how these can be accessed.

Additional guidance on report contents is provided in Annex G.

documented information shall be available to explain the rationale for establishing the scope and content of its reporting.

14.3 Reporting on a net zero aspiration

The organization shall include the following when reporting on committing to set a net zero target (see clause 16.2):

a) a commitment to reach organizational net zero by a specified date (see clause 10.2); and

b) a commitment to publishing a net zero transition plan and a pathway with interim targets, within two years .

14.4 Reporting on net zero transition planning

The following information related to net zero transition planning shall also be reported:

a) a base year GHG inventory and a transition plan, including information on actions planned, with estimated time frames, to reduce current GHG emissions and to enhance current CO_2 removals consistent with achieving the organization's interim and net zero GHG emissions targets and any associated organizational carbon budgets;

b) information on anticipated residual emissions and how these have been estimated;

c) plans for building the capacity to counterbalance residual emissions using carbon removals; and

d) allocation of material, financial and human resources to achieve interim and net zero targets and relevant updates thereof.

Where the organization has failed to meet an interim target , it shall demonstrate that it has updated its transition plan accordingly to return to its established pathway and explain the remedial actions proposed or undertaken (see clause 14.5).

14.5 Reporting to maintain a net zero transition plan claim

The organization shall demonstrate the implementation of its transition plan over the permissible 5-year claim period, by reporting annually on any defined target metrics, including GHG emissions (in tCO_2e), CO_2 removals, and other metrics compared to the base year and to the previous reporting period.

Where performance deviates from the stated pathway and results in underperformance, the organization shall, in its next annual report, explain the reasons for underperformance and the measures and timeline it is taking to return to its pathway.

14.6 Reporting on net zero aligned progress

14.6.1 General

Wherever necessary to make a claim, an organization shall report annually its progress on the following:

a) volume of GHG emissions, including types and emissions category/Scope;

b) progress towards GHG emissions reduction targets, carbon dioxide removal milestones (see clause 12.2), and any associated organizational GHG budgets, including the extent of any underperformance or over performance against its targets;

c) progress towards other defined targets, showing comparisons to base year and to the previous reporting period;

d) description of carbon dioxide removal activities, including details of how quality and durability have been determined (see clause 12.4);

e) if any, improvements and solutions implemented, including any difficulties encountered, since the previous reporting period and their impacts to date;

f) anticipated residual emissions based on a feasibility analysis (see clause 10.3); and

g) details of validation and verification.

14.6.2 Reporting on remedial action after missing an interim target

If an organization has missed an interim GHG emissions reduction target, but meets the criteria to have an adjustment period (see clause 16.6.3), it shall state in its public report, that it is in an adjustment or remedial period to return to its established pathway, explain the reasons for it and the subsequent planned or completed remedial actions (see clause 16.6), and include this information clearly whenever it refers to the achieved claim.

14.7 Reporting on action towards global net zero

The organization shall include the following when reporting on its actions towards global net zero (see clause 11.3) :

a) wherever relevant, activities to develop products and services, such as climate solutions, that accelerate global decarbonization but whose impacts are not reflected in the organization's GHG inventory;

b) information on its portfolio of climate finance (see clause 11.3.3), including:

   1) the value of the allocation, as a proportion of the organization's remaining GHG emissions in a given year;

   2) the rationale for its specific allocation, commensurate with its remaining annual GHG emissions;

   3) its use in the reporting period to deliver GHG mitigation with measurable outcomes; and

   4) details of any decarbonization initiatives in or outside the value chain , including any carbon credits purchased for this purpose, including how their quality has been determined, and public registry data;

c) direct and indirect policy advocacy activities and collaborative partnerships (for example, lobbying, participation in voluntary initiatives, trade associations, membership networks), to report on alignment and actions taken to address any misalignment with its own net zero targets and global net zero pathways;

d) measures taken to ensure its mitigation actions align with the United Nations Sustainable Development Goals (SDGs)[53] and United Nations Guiding Principles on Business and Human Rights [54]; and

e) information on steps taken to engage and collaborate with suppliers, customers and other organizations to determine actions to address indirect GHG emissions.

If avoided emissions are quantified, they shall be reported separately, and the disclosure requirements in clause 11.3.2 shall be followed.

14.8 Reporting on achievement and maintenance of net zero status

The organization shall report annually:

a) its full GHG inventory, including all GHG emissions it continues to generate, or which are generated as a consequence of its products and activities, including GHG types and sources;

b) details of any carbon dioxide removals used to counterbalance residual emissions, including storage durability, risk of reversal, public registry data for any removals credits, and plans to address any reversal;

c) evidence that ongoing GHG emissions are residual emissions (demonstrated by a feasibility test, see clause 10.3) and clarity on the potential for reducing residual emissions in future; and

d) plans to maintain the net zero balance over the long term.

Where relevant, the organization should also report on any climate action measures undertaken beyond its inventory boundary.

If, an organization is unable to maintain its net zero status, it shall acknowledge this as soon as reasonably practicable (see clause 16.6.4) and annually report on its efforts and progress to returning to net zero status.

14.9 Limitations of reporting

The organization shall communicate the limitations of its reports, including:

a) any sources of GHG emissions which are excluded, and justification for the exclusions;

b) use of GHG emissions proxies, averages, or gaps in knowledge within value chains; and

c) the results of the assessment of uncertainty (see requirement in clause 8.1)

NOTE 1 An organization can decide not to disclose confidential information associated with its net zero actions, provided this is permitted by the reporting standards or schemes to which it subscribes, does not mislead interested parties, the credibility of claims made is not undermined, and a valid explanation is included in the report.

NOTE 2 A GHG emissions proxy uses aggregated data from a range of sectors and sources to estimate GHG emissions from a complex process. Proxies usually relate to non-energy indirect emissions/Scope 3 emissions.

14.10 Credibility of reports

The organization shall establish processes to ensure:

a) comprehensive data collection and review;

b) the accuracy of GHG emissions and removals data; and

c) reports are free of material discrepancies.

Where necessary, the organization shall plan to improve data quality and reduce uncertainty (see ISO 14064-1:2018).

Information in reports shall be accurate and not overstate achievements.

Appropriate documented information shall be available of the processes for ensuring the credibility of reports and as evidence of the results.

15 Validation and verification

Fulfilment of requirements for making claims shall be validated or verified. The organization shall determine whether this is to be conducted by a first-, second- or third-party.

NOTE 1 Claims are likely to be viewed as more credible if third-party validation and verification have been undertaken. In some jurisdictions third-party validation and verification may be legal requirements for making net zero related claims.

For validation and verification documented information shall be available of the methods used and the scope of the validation and verification.

First and second party validation and verification shall be in accordance with ISO 14064-3 [61] or other recognised validation and verification standards.

Third party validation and verification shall be in accordance with ISO/IEC 17029:2019 [62], ISO 14065 [63] and ISO 14064-3 [61] or other recognised validation and verification standards.

NOTE 2 For validation and verification of reports, see the ISO 14019 series of standards on verification and validation of Sustainability Information.

16 Claims

16.1 General

16.1.1 Four stages of claim

Organizations can make claims for four different stages of net zero alignment , with each claim building on the preceding one:

— **1. Net zero aspiration** - the organization has started on the net zero alignment process and will set net zero targets and develop a transition plan.

— **2. Net zero aligned transition plan** - the organization has set net zero targets and developed a transition plan and commits to its implementation.

— **3. Net zero aligned progress** - the organization is making progress on the pathway to net zero, and is meeting its interim targets (or taking remedial action).

— **4. Net zero achievement** - the organization has achieved net zero and is committed to maintaining that status.

A summary of tasks and timescales for the four claims stages is provided in Table 1.

Table 1 — Claims framework

Claim	1: Net zero aspiration	2: Net zero aligned transition plan	3: Net zero aligned progress	4: Net zero achievement
Prior requirements	No prior net zero or carbon neutral targets	* GHG inventory * Transition plan net zero target pathway * First interim target in 5 years	Met first interim targets and milestones	Achieve net zero balance with plan in place to maintain status
Tasks	* Quantification * Set target and target date * Develop transition plan, with list of actions	* Implement first phase of transition plan * Report on progress after 2.5 years and adjust as needed	Meet next interim targets and milestones	Maintain net zero emissions
Complete by	2 years from making claim	5 years maximum, then move to Progress claim	Renew Progress claim every 5 years	Demonstrate net zero status each year
Extension if remedial actions are taken	1 year	2 years, with additional 1 year extension OR 3 year adjustment period with corrective actions	3 year adjustment period with corrective actions	3-year adjustment period with corrective actions
Example of a company that has never had a net zero target or similar 2027 - makes Target claim - develops a 2050 net zero target and transition plan 2029 - makes Committed claim - but needs an extra 2 years to meet first interim target 2036 - makes Progress claim - stays on pathway and meets second interim target 2041 - renews Progress claim -misses third interim target, but keeps Claim with an adjustment period of 2 years (this is second adjustment) 2048 - on track to net zero and meets 2 years later 2050 - makes Achieved net zero claim and maintains every year				

Organizations that have an existing or previously stated net zero, or similar (e.g. carbon neutral, climate positive) goal or target shall not use the net zero aspiration claim, but shall instead work towards the Stage 2 net zero aligned transition plan claim by developing a transition plan.

NOTE The Carbon Neutrality Management Plan described in ISO 14068-1:2023 [12] can form the basis of a net zero transition plan.

Any claim shall be linked to the organization's boundaries and its scope, including any relevant time-frame, other than the claim of having a net zero aspiration, and shall be consistent with its public report.

16.1.2 Claims and principles

In developing and making claims the organization shall take into account the principles set out in Clause 4 of this document.

Avoided emissions shall not be included in claims of progress towards targets for the reduction of direct GHG emissions/Scope 1 emissions, indirect energy GHG emissions/Scope 2 emissions, and other indirect GHG/Scope 3 emissions.

16.1.3 Minimum requirements for the four claim stages

Organizations making claims based on the definitions of the above four stages shall conform in full with the relevant requirements of this document. See Note below on the requirements related to making each claim and to public reporting (see Clause 14).

NOTE To access a table summarising the requirements for each of the claims please use the following link: https://standards.iso.org/iso/14060/ed-1/en

16.1.4 Making a claim

An organization can disclose a claim through various means and communication channels (e.g. through a company's website, an annual climate report, sustainability report, a statement or a declaration).

The claim shall be consistent with the public report (see Clause 14). The information supporting the claim shall be evidence-based, comparable over time, consistent with, and linked to, information made publicly available by the organization .

An organization shall include sufficient information to allow the users of the claim to understand which stage of the claim the organization is making and any limitations of that claim.

The organization shall include information in the claim about how the claim has been validated (related to future projections) or verified (related to the reported data for the relevant period). See Clause 15 .

NOTE 1 A claim, wholly or in part, can be validated or verified by third parties such as accredited validation and verification bodies, by second parties such as an entity in a supply chain, or internally by the organization . Third party validation and verification reflects best practice and provides greater credibility. See Clause 15 for requirements for validation and verification.

NOTE 2 The communication of claims can be subject to various legal or regulatory requirements, or both, depending on the type of claim, the audience and the jurisdiction.

16.1.5 Claims and organizational boundary changes

If the organization makes a significant change in its organizational boundary (such as, divesting part of the organization, acquiring another organization, merging with another organization, outsourcing activities or combinations of these activities), it shall re-evaluate its GHG inventory boundary . If necessary, in order to follow its base year recalculation policy, it shall recalculate and restate its base year GHG inventory . It shall then re-evaluate its net zero commitments and plans within two years of the change.

The organization shall consider the consequences of its new organizational boundary and GHG inventory boundary for its original GHG inventory base year, its pathway, targets and plans. It shall explain any changes required by the new boundary in the interests of transparency and comparability.

If the original organization remains as a distinct entity within the new boundary, then it can maintain its separate net zero transition plan and continue its delivery of its targets separately.

16.2 Net zero aspiration claim

16.2.1 General

To make a net zero aspiration claim, organizations shall meet all requirements related to this Stage 1 claim as set out in the table of requirements.

NOTE To access a table summarising the requirements for each of the claims please use the following link: https://standards.iso.org/iso/14060/ed-1/en

16.2.2 Communicating a net zero aspiration claim

The shortest form in which an organization shall refer to this claim is "commits to set a net zero target", providing a direct link to a public report and any public supplementary information (e.g. a publicly available report with full details of requirements).

The organization shall not use other language to suggest it is already net zero aligned or on the pathway towards or has achieved net zero.

Communication by the organization referring to this claim should follow the suggested wording below:

— "Organization XX is committed to developing a net zero target according to ISO 14060".

— “We commit to publishing a net zero transition plan, including a pathway with interim targets, within 24 months, but aiming at 12 months, along with a list of GHG reduction initiatives to be implemented or initiated within this period”.

— “Our claim has been validated 1) by accredited body NNN, or 2) by entity XX in our value chain , or 3) internally by the organization . The claim is consistent with our public report dated mmmm”.

16.2.3 Maintaining a net zero aspiration claim

Eligible organizations, which fulfil all the relevant requirements (see table of requirements), may maintain a claim of having a net zero aspiration for a period of two years after they first make the claim. At this time, they shall meet the criteria for the “net zero aligned transition plan” claim (see clause 16.3), including having a GHG inventory , interim targets and a transition plan.

Where an organization fails to meet all planning requirements within this time-frame, it shall document reasons and demonstrate progress in making an inventory and setting interim targets. The organization may refer to the net zero aspiration claim for a further year as it develops a transition plan.

If it fails to make this information public by the end of the two-year deadline, the organization shall cease to refer to the net zero aspiration claim and withdraw the claim from all external communications media.

16.3 Net zero transition plan claim

16.3.1 General

To make a net zero aligned transition plan claim, organizations shall meet all the requirements related to Stage 2 claim as set out in the table of requirements.

NOTE To access the table summarising the requirements for each of the claims please use the following link: https://standards.iso.org/iso/14060/ed-1/en

16.3.2 Communicating a net zero aligned transition plan claim

The shortest form in which an organization shall refer to this claim is “committed to implementing a net zero aligned transition plan to reach net zero by 20XX”. The organization may also refer to its “net zero aligned targets”.

It shall provide a direct link to the public report and any public supplementary information (e.g. a publicly available report with full details of requirements).

The organization shall not make the claim without using the term “net zero aligned transition plan”. It shall not use other language to suggest it is already on the pathway towards or has achieved net zero.

Communication by the organization referring to this claim should follow suggested wording:

— “Organization XX is committed to implementing a net zero aligned transition plan and to reach net zero by 20XX, according to ISO 14060”.

— “Our net zero targets, pathway and transition plan meet the requirements of ISO 14060”.

— “Our claim has been validated/verified 1) by accredited body NNN, or 2) by second party XX in our value chain, or 3) internally in the organization. The claim is consistent with our public report dated MMMM”.

16.3.3 Maintaining a claim related to a net zero aligned transition plan claim

To maintain a net zero aligned transition plan claim, the organization shall report annually on progress against key indicators, listed in clause 14.5 , in implementing its transition plan, as it aims to deliver its targets and removal milestones.

Where performance deviates significantly from its stated pathway, the organization shall document reasons and the measures and timeline it is taking to meet its first interim target (see clause 16.6 for further

requirements if the organization misses interim targets). If it fails to make information about the deviation from its previously reported pathway public within 30 months of making its net zero aligned transition plan claim, the organization shall cease to refer to the claim and withdraw the claim from all external communications media.

If the organization meets the relevant requirements and reports this information, it can refer to the net zero aligned transition plan claim for a maximum of 5 years after the claim is made. At 5 years, or earlier, it can make a claim related to net zero aligned progress (see clause 16.4), if it has met all the requirements for that claim.

If it has not met the requirements to make a Stage 3 net zero aligned progress claim within 5 years after making its Stage 2 net zero aligned transition plan claim (i.e. when its first interim target date is reached), it shall cease to claim that it has a net zero aligned transition plan unless it has taken or is taking remedial measures to return to its pathway in accordance with clause 16.6 on Remedial Action.

16.4 Net zero aligned progress claim

16.4.1 General

To make a net zero aligned progress claim, organizations shall meet all requirements related to this Stage 3 claim as set out in the table of requirements.

NOTE To access the table summarising the requirements for each of the claims please use the following link: https://standards.iso.org/iso/14060/ed-1/en

16.4.2 Communicating a net zero aligned progress claim

The shortest forms in which an organization shall refer to this claim is “on a net zero aligned pathway” or “making progress towards net zero in 20XX”.

It shall provide a direct link to the public report and any public supplementary information (e.g. a publicly available report with full supporting details).

The organization shall not make the claim without using the term “on a net zero aligned pathway to” or “making progress towards”. It shall not use language to suggest it has achieved net zero.

Communication by the organization referring to this progress claim should follow this suggested wording:

— “Organization XX is on a net zero aligned pathway to net zero according to ISO 14060, with a target date of 20XX”.

— “We have achieved our 20XX interim targets and milestones and met the requirements of ISO 14060”.

— “Our claim has been validated/verified 1) by accredited body NNN, or 2) by second party XX in our value chain, or 3) internally in the organization. The claim is consistent with our public report dated MMMM”.

NOTE Communications by organizations that miss the target, but are eligible for an adjustment period, are defined in clause 16.6.3.

16.4.3 Maintaining a net zero aligned progress claim

To maintain a net zero aligned progress claim, the organization shall annually report on progress against key indicators listed in clause 14.6.1 , as it aims to deliver its targets and removal milestones.

Where performance deviates from its stated pathway, the organization shall document reasons and the measures and timeline it is taking to return to its pathway (see clause 16.6 for further requirements if the organization misses interim targets). If it fails to make information about the deviation public within 30 months of its previous interim target , the organization shall cease to refer to the claim and withdraw the claim from all external communications media.

If it provides this information about the deviation, an organization may refer to the net zero aligned progress claim for a maximum of 5 years after the claim is made.

At this time, its performance on the next interim target and milestone (or on the way to it) and other requirements for this claim shall be validated/verified. If the organization fails to provide this information or misses its next interim target , the organization shall cease to refer to the net zero aligned progress claim unless it has taken remedial measures to return to its pathway, according to the clause on Remedial Action (see clause 16.6).

16.5 Claims related to achievement of net zero as an organization

16.5.1 General

To make an achievement of net zero claim, organizations shall meet all requirements related to this final claim (achievement of net zero) as set out in the table of requirements.

NOTE To access the table summarising the requirements for each of the claims please use the following link: https://standards.iso.org/iso/14060/ed-1/en

16.5.2 Communicating a claim related to achievement of net zero

The shortest form in which an organization may refer to this claim is “achieved net zero” or “net zero organization ”. It shall provide a link to the public report (see Clause 14) and any supplementary information including full details of requirements.

Communication by the organization referring to the achievement claim should follow this suggested wording:

— “Organization XX has achieved organizational net zero according to ISO 14060”.

— “We have met our net zero emission reduction target(s) and implemented annual counterbalancing of all our residual emissions with durable carbon dioxide removals, fulfilling the requirements of ISO 14060”.

— “Our claim has been validated/verified 1) by accredited body NNN, or 2) by second party XX in our value chain , or 3) internally in the organization . The claim is consistent with our public report dated MMMM”.

— “We are committed to maintaining this status and aim to improve it, for example by reaching net negative GHG emissions or further reducing residual emissions, or both”.

16.5.3 Maintaining a claim related to achievement of net zero as an organization

To maintain a claim related to the achievement of net zero, the organization shall annually publish or provide on its website a public report (e.g. annual report, sustainability report, public-facing transition plan) which includes, as a minimum, the reporting requirements on achievement and maintenance of net zero status (see clause 14.8).

16.6 Remedial action

16.6.1 General

An organization that does not meet its GHG emissions reduction targets may continue referring to its claim while it works to return to its previously reported pathway under certain conditions. These conditions depend on the size of the GHG emissions gap and the stage of the claim.

16.6.2 Returning to net zero pathway if an interim target is missed

If an organization exceeds its interim Scope 1 budget or misses either of its Scope 2 or 3 interim GHG emission reduction targets, it may return to its net zero pathway , within the framework of the standard, if the following criteria are met:

— it has reduced GHG emissions in each Scope since the prior interim target date (or to the base year for the first interim targets);

— the organization has implemented its transition plan according to its timeline (see clause 16.6.3); and

— it addresses the excess emissions by financing climate mitigation activities (see clause 16.6.4)

There are three possible ways to maintain or regain a progress claim (see clause 16.5) depending on the level of overshoot:

a) Remedial action plan: if an organization misses its interim Scope 1 budget target, but meets its Scope 2 and 3 interim targets, it must demonstrate that it can stay within its carbon budget and provide a remedial action plan (see clause 16.6.5).

b) Adjustment period: if an organization demonstrates it can stay within its Scope 1 carbon budget, but has missed one or both of its Scope 2 and 3 targets by no more than 25%, it may maintain its Progress claim (see clause 16.4), with a disclaimer that it is in an adjustment period to return to its net zero pathway in that Scope. An organization may remain in an adjustment period for up to 3 years, as long as it fulfils the requirements in clause 16.6.6.

c) Remedial period, without Claim: if an organization cannot stay within its total Scope 1 carbon budget or has overshot its Scope 2 or 3 targeted emissions levels at an interim target date by more than 25%, it is no longer considered to have net zero aligned progress. It may, however, enter a remedial period to regain its claim once it returns to its net zero pathway . An organization may remain in a remedial period for up to 3 years, as long as it fulfils the requirements in clause 16.6.7 .

NOTE The degree to which an organization misses a target is defined as a percentage of interim target GHG emissions, not of the GHG emission reduction. For example, if an organisation's interim target GHG emissions were 100tCO_2e and its actual emissions were 110t CO_2e, it would have exceeded its target by 10%.

EXAMPLE An organization misses its first Scope 3 interim target by 18% and its Scope 1 budget target by 7%. It is eligible to enter an adjustment period and maintain its Progress claim, however, because its Scope 1 is still within budget, its Scope 3 overshoot is below the 25% threshold and its emissions level is below that in its base year.

Scope	Threshold for adjustment period	Base year emissions ($MtCO_2e$)	First interim target emissions ($MtCO_2e$)	Actual emissions at interim target date ($MtCO_2e$)	% target overshoot	Calculation
1	Still in carbon budget	40	30	32	7%	(32-30)/30
2	25%	10	6	6	0%	-
3	25%	150	120	142	18%	(142-120)/120

During an adjustment or remedial period, the organization shall work on the immediate implementation of reduction measures to be back on track as soon as possible within the three-year period.

Use of an adjustment or remedial period does not compensate for excess emissions. These still need to be addressed. The organization shall update its transition plan by recalculating its required net zero pathway to meet the requirements of this standard and ultimately claim net zero.

Organizations shall be entitled to a maximum of two non-consecutive adjustment or remedial periods (i.e. an organization is not eligible for a second period if it already missed its previous interim target .)

16.6.3 Demonstrating implementation of the transition plan

To demonstrate that it has implemented its transition plan according to its timeline, an organization shall:

a) provide verifiable evidence that:

   1) it has implemented all the actions in accordance with its transition plan and timeline; or

   2) any deviation was not a result of the organization 's decision to delay or avoid taking any particular action but was a result of external factors, beyond the organization's control or influence, that made certain actions in their transition plan impossible to undertake.

b) explain the barriers and challenges in reaching the interim reduction target and provide evidence that it is taking additional measures to address these and that these measures can return the organization to its net zero pathway , updating its transition plan accordingly.

c) outline these reasons, the measures to address them, and a timeline for doing so in its annual report or other publicly available information, including how the organization plans to address external dependencies, as outlined in clause 11.3 Taking Action for Global Net Zero.

16.6.4 Addressing excess emissions

The organization shall address its excess emissions in the interim target year by financing additional and additive climate mitigation activities, in or outside its value chain , before the end of the adjustment or remedial period. If activities take place inside the value chain , they shall be clearly distinguished from actions that the organization has previously committed to, as set out in its transition plan (Clause 9).

Activities may include interventions with direct mitigation outcomes, such as direct finance for or retiring high-quality carbon credits from reduction or removal projects, or indirect mitigation outcomes, such as funding emerging climate technologies, among others.

The organization may either estimate the impact of these activities in CO_2e at a level equal to or greater than the emissions exceeding the interim target or targets, or apply internal carbon fee to excess emissions, at a level to be justified by the organization , in order to finance climate mitigation activities (see clause 11.3.3 for further guidance).

NOTE 1 Excess emissions refers to the CO_2e that is emitted beyond the volume included in the interim target in the target year.

NOTE 2 Standards and guidelines for high-quality carbon credits are being developed by a number of voluntary, national and supranational bodies, including the Integrity Council for the Voluntary Carbon Market (ICVCM), CORSIA and the Article 6.4 (Paris Agreement) Supervisory Body.

16.6.5 Scope 1 carbon budget remedial action plan

If an organization's direct GHG emissions/Scope 1 GHG emissions overshoot its interim budget target in any interim target year after the base year , it shall:

a) provide a remedial action plan, which should be made public within 3 months, detailing the actions it intends to take to remain within the organizational budget by its next interim target year.

b) demonstrate and publicly disclose that its reduction pathway still allows the organization to stay within its organizational carbon budget, adjusting interim budget as needed.

16.6.6 Returning to net zero pathway with an adjustment period

While within an adjustment period, the organization shall:

a) add the following to publicly available information about its claim:

   1) Clearly state that it is in an adjustment period to return to its net zero pathway

2) Clarify which Scopes of emissions are impacted

3) Show clearly the percentage and emissions volume by which the organization has deviated from its net zero pathway

b) report annually on implementation progress of indicators outlined in its transition plan to deliver its targets and milestones, including any updated financial planning and value chain reduction efforts needed to return to its net zero pathway .

If the organization meets these criteria it may continue to communicate its claims, using this suggested wording:

“We missed our Scope X interim reduction target by X% and are in an adjustment period for that Scope to ensure we continue to make progress on the pathway to net zero and achieve our net zero target in 20XX, according to ISO 14060”.

To exit an adjustment period, at any time within the 3-year allowance, the organization shall provide evidence and verify that it has returned to its net zero pathway and is eligible for the Progress claim.

If it fails to demonstrate implementation of remedial measures during the adjustment period, or fails to exit after 3 years, it shall cease referring to the claim.

16.6.7 Returning to net zero pathway with a remedial period

If an organization is eligible for a remedial period (see clause 16.6.2), it shall provide a binding Remedial Plan within 12 months of the interim target date. This plan shall detail:

a) root cause analysis of not meeting its targets;

b) specific accelerated catch-up measures to show how it plans to get back to the net zero pathway , making up the excess emissions, plus the required reduction for the next interim period;

c) evidence (such as 5-year investment plans) that the capital and resources for the accelerated schedule are secured; and

d) timeline for regular review, providing evidence that implementation milestones (e.g., procurement of key equipment, commencement of construction) are met.

Implementation of the Remedial Plan shall be verified annually.

If the organization meets these criteria it may communicate its commitment to net zero, using this suggested wording:

“We missed our Scope X interim reduction targets by X% and are no longer able to make a claim under ISO 14060. We are implementing a remedial plan to regain our claim to progress on the pathway to net zero and achieve our net zero target in 20XX according to ISO 14060”.

If the organization fails to return to its net zero pathway for a third consecutive year (or fails to implement the Remedial Plan), it shall cease to refer to the standard in its communications.

An organization may restart a claim process if it returns to the net zero pathway .

16.6.8 Returning to net zero status

If, having achieved and claimed net zero, an organization’s GHG emissions rise above the level of residual emissions defined in its net zero pathway , or it fails to counterbalance its residual emissions effectively (e.g. due to a carbon dioxide removal reversal or a failure to deliver) it shall as soon as reasonably practicable:

a) publicly acknowledge the temporary loss of its net zero status;

b) explain the reasons for the loss of its net zero status and provide evidence that it is working to address these and that these efforts can return the organization to its net zero pathway within a maximum of three years, updating its net zero pathway accordingly;

c) source sufficient durable carbon dioxide removals to account for all excess emissions above the residual level; and

d) annually publish reports disclosing efforts and progress to returning to net zero status.

If after 3 years the organization is unable to return to net zero status, it shall cease using the net zero claim until it can once again make a claim that is appropriately verified.

Annex A
(informative)

Guidance for small and medium-sized enterprises (SMEs)

A.1 General

This annex provides guidance on the opportunities and challenges that are faced by SMEs in their transition to net zero who may initially lack the time, resources, expertise, or capacity to comply with the full requirements of this document. Specifically, this annex outlines:

— which organizations identify themselves as SMEs,

— which requirements of the main standard can be challenging for SMEs; and,

— what approaches SMEs may consider instead.

Note that the annex does not provide the basis for SMEs that are unable to fulfil all of the necessary requirements to make claims of conformity to this document.

Organizations currently not able to meet the requirement of this document are encouraged to review their circumstances and capabilities periodically, to determine whether conformity with the standard would be feasible.

The intended users of this annex are:

— SMEs who want to work towards net zero, but lack the time, resources, or capacity to conform fully with the standard at this time.

— companies wishing to seek disclosures from SMEs in their supply chains to understand the challenges they face.

A.2 Determination of SME status

This annex does not provide a prescriptive definition of micro, small, and medium businesses, since there are varying definitions in legislation in different countries and regions. Organizations should determine whether they are defined as an SME within their country or region. If there is no recognized definition, organizations determine their own status, considering the following factors:

— The number of employees;

— Annual turnover; and

— Assets under management.

An SME is an independent legal entity. Businesses that meet the above requirements but are subsidiaries of larger entities are not considered SMEs for the purposes of this document.

Franchises of large corporations can be SMEs as separate legal entities. In these situations, the franchisees can use this annex for guidance. However, if the franchiser is a large company that intends to make a claim, the requirements of this document would apply.

Organizations that do not meet the criteria for classification as SMEs can find this Annex helpful.

A.3 GHG Emissions quantification considerations

A.3.1 General

It can be challenging for SMEs to gather comprehensive and complete GHG emissions data due to limited:

— availability of data of sufficient accuracy, especially from its customers, suppliers, landlords, etc.;

— availability of local, national or regional emissions factors (e.g., for estimating waste, fuel and energy);

— availability of local, national or regional average activity data that can affect the ease and accuracy of calculations (e.g. when estimating employee commuting);

— time, resources, or capacity.

SMEs can consider using freely available emission calculation tools as a starting point. When assessing the suitability of these tools, SMEs should consider:

— that many tools do not include all categories of GHG emissions, so SMEs should understand which sources of GHG emissions are not included and assess whether those could be significant to their business; and

— assessing the tool to ensure that the methodology, assumptions, and inputs used are transparent and appropriate.

NOTE Various free tools are available that can help SMEs estimate their GHG emissions. For example, the GHG Protocol and the SME Climate Hub provide calculation tools with transparent methodology and coverage of all relevant GHG emissions.

Direct GHG emissions/Scope 1 emissions are expected to be straightforward for SMEs and should be calculated and disclosed.

Energy indirect GHG emissions/Scope 2 emissions from sources directly procured by the SME can be relatively straightforward to calculate. If energy use is paid for and managed by another party (e.g., landlord) then data should be requested from that party and, failing this, an estimation should be made. A common challenge SMEs face is not knowing whether a “renewable tariff” can be used to reduce its declared GHG emissions, although a landlord may be able to provide this information.

A.3.2 Considerations for other indirect emissions/Scope 3 emissions

The quantification clause 8.1 in this document, explains that organizations should quantify significant other indirect emissions/Scope 3 emissions. If a category is significant, SMEs should try to reasonably estimate their GHG emissions but also assess whether there are better and less costly ways to track progress.

Spend-based calculations can be a quick and easy way to quantify GHG emissions and identify hotspots, but this method is the least accurate for tracking emission reductions. However, more accurate quantification methods can be too burdensome, and prohibitively costly (e.g. due to consultant costs, tool costs, and emission factor costs) for SMEs.

NOTE Sector-specific guidance is sometimes available to guide GHG quantification.

To quantify other indirect GHG emissions /Scope 3 emissions, SMEs can begin with products or services that they pay for directly. Identifying GHG emissions caused by activities of tier 2+ suppliers or clients can be more challenging, but can be prioritized if this is a significant part of their business. For example:

— The quantification of ISO Category 3 indirect emissions from transport (GHGP Scope 3 Categories 4, 6, 7 and 9) can vary in difficulty for SMEs. Where transportation is paid for directly by the organization , quantification of the GHG emissions can be straightforward. Where transportation is paid for by value chain stakeholders, quantification of the GHG emissions can be significantly harder. If transportation is a significant source of GHG emissions due to the nature of the organization's activities, then the organization should prioritize quantification of these GHG emissions;

— Employee commuting can be estimated, for example, from employee records or an annual survey; and

— ISO Category 4 indirect emissions from products an organization uses (GHGP Scope 3 Categories 1, 2, 3, 5 and 8) are likely to be more challenging for SMEs to measure using activity-based approaches. SMEs can use spend-based measurement tools to estimate and identify hotspots in emission sources.

The quantification of ISO Category 5 emissions from the use of products produced by the organization (GHGP Scope 3 Categories 10, 11, 12, 13, 14, 15) will vary in difficulty for SMEs based on the level of influence they have with users downstream in their value chain and are commonly excluded from SME-facing calculators. For example:

— It can be relatively straightforward to mandate GHG emissions disclosures from franchisees, whereas third party customers can be much more challenging; and

— Indirect GHG emissions/Scope 3 emissions resulting from the use, processing and disposal of products and services delivered by the SME can be assessed for impact according to magnitude and influence to determine the degree to which this is likely to impact the organization's overall inventory. Where this is likely to be a significant source within the organization's overall GHG emissions, it should estimate these emissions and identify opportunities to redesign products and services to reduce their emissions.

SMEs may exclude indirect GHG emissions /Scope 3 emissions categories from their inventory that are not significant, as long as they disclose why. For many SMEs, this can greatly reduce the quantification workload. An example of a source of GHG emissions that an SME might identify as minimal is Category 9 - Downstream transportation and distribution. For example, a maintenance company that undertakes activities at client sites may exclude emissions from downstream transport as it does not use these services for products.

Other categories of emissions may not be relevant. For instance if no capital assets were purchased, as evidenced by the balance sheet, Category 2 (Capital Goods) may be excluded.

A.4 Net Zero Transition plan for SMEs

A.4.1 General

SMEs can set targets and develop interim net zero transition plans to address their:

— direct GHG emissions /Scope 1 emissions;

— energy indirect GHG emissions /Scope 2 emissions; and

— most significant categories of other indirect GHG emissions /Scope 3 emissions.

SMEs can document these plans, assess progress against targets, and can report actions taken and their estimated impacts. These plans should be reviewed and updated regularly.

NOTE More guidance on net zero transition plans for SMEs can be found in documents such as BSI Flex 3030:2024 v2 *Net Zero Transition Plans for SMEs - Code of Practice* [64]which can be freely downloaded.

A.4.2 Other Indirect greenhouse gas emissions/Scope 3 emissions significance

SMEs can apply the significance test set out in the main text in clause 10.6.2 , or they can develop their own simplified criteria. Potential magnitude is the most straightforward factor for determining significant sources of other indirect GHG emissions/Scope 3 emissions for SMEs. SMEs can also consider how much control they have over the source of GHG emissions and how closely the source is linked to their core business activities. They can prioritize GHG emissions sources that can be addressed, for example through:

— How their products & services are designed (e.g. changing the inputs or design of their products; making them more efficient, repairable, returnable, or recyclable);

— How they make and sell their products and services (e.g. reducing waste from manufacturing, changing sourcing tactics, making transport & logistics more efficient);

— How the suppliers of inputs to their product and services act (e.g. helping suppliers decarbonize);

— How their customers or the end consumers of their products and services act (e.g. engaging customers to change behaviours using marketing and incentives);

— How they run the rest of the business (e.g. choosing lower carbon options for general business travel, telecommuting policies, encouraging behavioural changes with employees).

A.4.3 Setting targets

SMEs are more likely than large organizations to face challenges in setting ambitious and achievable targets for a number of reasons:

— They are more likely than large organizations to grow significantly in size over a multi-year period, making absolute emission reductions extremely challenging (i.e. start-ups);

— They are more likely to rely on spend-based quantification for some or most of their other indirect/Scope 3 emissions due to cost, for which they will not be able to track emission reductions; and

— They are less likely to have access to the same emission reduction tools and expertise as larger organizations.

SMEs can therefore consider instead:

— Committing to a net zero target date aligned to an appropriate pathway;

— Setting interim targets within 1-5 years of their current reporting period;

— Setting intensity-based interim targets;

— For other indirect GHG emissions/Scope 3 emissions, SMEs should take account of their size, capabilities and degree of influence when determining the extent of emissions categories they include in their target-setting. For example, micro-SMEs could start by setting a target for only their most significant emissions category, whereas medium-sized SMEs could decide to set a target for at least their top three categories.

— For indirect GHG emissions /Scope 3 emissions categories that are quantified from spend, setting activity-based targets, such as:

  — If purchased goods and services are a significant source of GHG emissions, set a supplier engagement target;

  — If a significant source of GHG emissions is use of products: track and improve energy efficiency, or a product's useful life;

  — If a significant source of GHG emissions is the meat served in a restaurant, set a target for percentage of vegetarian options offered;

  — If a significant source of GHG emissions is short-haul business flights, track how many employees take trains, share car journeys or use online meetings.

A.5 Reporting Considerations

Where practical, SMEs should disclose progress against their net zero transition plans, including GHG emissions and targets, at least every 3 years.

Large organizations seeking disclosures from SME suppliers should align with national SME disclosure requirements where they exist.

Annex B
(informative)

Ambition

Organizations with higher technical and economic capacity, historical responsibility or high current GHG emissions should act with higher ambition.

Higher ambition can be demonstrated by, for example:

— setting targets that encompass all categories of GHG emissions (rather than all "significant" indirect GHG emissions categories);

— reducing emissions faster than the organization's science-based regional and sectoral pathway requires;

— arranging third-party verification of GHG inventories and third-party validation of net zero commitments, targets and plans;

— rapidly phasing out products and services that could lock-in the use of fossil fuels;

— rapidly reducing reliance on fossil fuels throughout the organization and its value chain ahead of national or sector targets;

— discontinuing in the near term the production of products that are not aligned with a net zero pathway ;

— developing climate solutions that other organizations and consumers can use to reduce their GHG emissions;.

— achieving net zero at organizational level significantly in advance of any national or sectoral targets for net zero;

— working towards a state in which the organization's annual CO_2 removals exceed its GHG emissions;

— purchasing and retiring carbon reduction or removals credits to address all, or a portion of, historical GHG emissions (prior to base year)

— establishing and exceeding interim milestones for CO_2 removals that cover a substantial share of ongoing emissions.

If the organization is addressing historical GHG emissions, these emissions should be treated separately and actions to address these GHG emissions should not be used to meet interim and net zero targets.

Annex C
(informative)

Additional guidance on greenhouse gas mitigation action

C.1 General

The organization can undertake any or all of the GHG mitigation actions below.

C.2 Generic greenhouse gas mitigation actions

The following are examples of generic actions that lead to or incentivize mitigation

a) aligning executive and board compensation with meeting interim and net zero targets (e.g. connecting GHG emission reduction targets with a percentage of compensation plans);

b) implementing internal carbon pricing to allocate funds for GHG mitigation;

c) when addressing competence, prioritising the reskilling of the existing workforce;

d) enhancing ecosystems to increase GHG removals ;

e) examining the potential to use alternative processes (e.g. in line with circular economy practices), equipment or facilities with lower GHG emissions;

f) reducing significant GHG sources or GHG emissions “hot spots” - the activities that generate the most GHG emissions;

g) removals enhancements, for example through afforestation, building with biomass (plant-based material used in construction), habitat restoration, soil carbon capture and energy production from biomass with carbon capture and storage.

NOTE Examples of carbon dioxide removals with minimal risk of reversal include direct air carbon capture and geological storage (DACCS); biochar storage in long-lived products such as asphalt, concrete or cement, enhanced rock weathering and mineralisation in concrete and cement.

C.3 Mitigation actions for direct greenhouse gas emissions/Scope 1 emissions and energy indirect greenhouse gas emissions/Scope 2 emissions

The following are examples of GHG mitigation actions for direct GHG emissions /Scope 1 emissions andenergy indirect GHG emissions /Scope 2 emissions:

a) transitioning to renewable energy for processes, buildings and sites, and setting a target for on-site renewable energy generation;

b) implementing energy management systems to improve efficiency of energy consumption and promote continual improvement;

c) encouraging the development of additional renewable energy production, for instance by investing in on-site renewables and in contractual agreements that trigger the additional production of low carbon energy

d) conducting energy audits on a regular basis to identify areas (hotspots) for further efficiency improvements

e) aligning energy consumption with the availability of low carbon energy/renewable energy, and minimizing consumption when the grid is reliant on high-emission energy;

f) transitioning away from dependence on fossil fuels, including phasing out the use of coal;

g) establishing and applying policies to phase out production of fossil fuels including responsibly retiring assets,

h) optimizing energy use of buildings (e.g. through repurposing, retrofitting, digital automation);

i) avoiding leakage of GHGs (such as methane or refrigerants) from plant and equipment;

j) implementing low carbon cooling, heating, ventilation and switching to non-GHG refrigerants;

k) maximising utilization of waste energy streams such as exhaust heat;

l) phasing out use of high GWP synthetic GHGs;

m) identifying and implementing low-carbon alternatives for process emissions;

n) minimising, or capturing and storing fugitive emissions;

o) minimizing waste and reducing consumption of raw materials and energy by repurposing or retrofitting buildings rather than building new facilities;

p) improving efficiency in transportation systems and transitioning fleets to low GHG emission vehicles;

q) ensuring new facilities and operations are near zero GHG emission by design;

r) ensuring all buildings, equipment, machinery and vehicles are regularly maintained;

s) integrating climate criteria into research and development and product and service design processes to improve energy performance and develop circular economy solutions;

t) systematically reducing energy, resource and material use and waste in all operations.

NOTE ISO 50001 [65] provides information on implementing an energy management system.

C.4 Mitigation actions for other indirect greenhouse gas emissions /scope 3 emissions

The following are examples of GHG mitigation actions for Scope 3.

a) developing products and services that contribute to the emergence of alternative value chains (e.g. using plant-based protein in processed food products instead of meat);

b) redesigning and developing products and services to reduce their life cycle GHG emissions;

c) promoting, supporting and facilitating the circular economy (e.g. reuse, repair, refurbishment, repurposing, recycling, regrowth);

d) requiring suppliers to commit to net zero targets, in line with the recommendations in this document;

e) prioritizing suppliers based on their emissions per unit of product, net zero commitments, emission reduction progress and transparency of emission data;

f) providing financial support and sharing knowledge and technology;

g) collaborating with other organizations and sector or industry partners to strengthen and align procurement and purchase requirements;

h) extending collaboration with other organizations and the value chain to accelerate adoption of low carbon energy and achievement of interim and net zero GHG emission reduction targets;

i) implementing GHG emission reduction and removals projects within the value chain ;

j) ensuring financial investments, including assets, loans, bonds and funds, are aligned with the organization's net zero commitments;

NOTE Indirect Category 5 (in GHGP Scope 3 category 15) emissions from investments are of particular relevance to financial institutions, which could consider options for reducing GHG emissions such as portfolio engagement, portfolio shift, phase-out, green/transition finance, green solutions/offerings.

k) prioritizing use of low carbon mobility solutions (e.g. public transport, electric vehicles with appropriate charging infrastructure);

l) reducing the need for travel by holding virtual rather than in-person meetings;

m) facilitating working from home where this is likely to cause fewer overall GHG emissions;

n) creating local office hubs to reduce commuting distance;

o) choosing technology and other service providers and suppliers that have committed to robust organizational net zero targets;

p) supporting nature-based solutions such as forest protection and restoration, and sustainable land management within organizations' value chains;

q) minimising or avoiding air travel;

r) providing and promoting low carbon diets, such as plant-based food in staff restaurants or canteens.

Annex D
(informative)

Organizational greenhouse gas budget allocation methods

D.1 General

Clause 10.3 establishes requirements for using an organizational CO_2 budget for Scope 1 target setting. If an organization has relevant emissions of other GHGs, the corresponding budgets should be determined as outlined in Annex G, and be added to the CO_2 budget to obtain the organizational GHG budget. The organizational GHG budget represents the cumulative GHG emissions between the base year and the net zero year (in a graph this is the area under the organization's GHG emission reduction pathway line).

Clause 10.2 prescribes the use of peer-reviewed allocation methodologies to establish the organizational GHG budget . Two allocation methods (the absolute reduction approach using budget factors f, and the sectorial decarbonization approach) are described below to illustrate how an organizational GHG budget for Scope 1 can be calculated. Other allocation methods (for example based on turnover or physical activities) can also be used, if the underlying methodology has been published in a peer-reviewed journal. The chosen allocation method used by an organization should be appropriate for the organization's sectoral and regional context.

This annex describes the theoretical basis of allocation methods. Practical examples can be found at the end of Annex F .

D.2 Absolute contraction approach using budget factor f

The absolute contraction approach results in organizational GHG emission reduction pathways that are independent of the growth rate of a company. In the context of this standard, absolute reduction methods are based on the organizational GHG budget for Scope 1, which can be derived from a relevant sectoral net zero pathway .

Budget allocation from the global or sectoral carbon budget to organizational GHG budget is based on the organization's base year Scope 1 emissions. Budget factors *f* can be used to quantify the organizational GHG budget for Scope 1 based on the sectors and the locations in which an organization operates countries (see Table E.1 , Table E.2 and Table E.3 for more details). To determine the organizational GHG budget for Scope 1 emissions, an organization should multiply its base year GHG emissions in each country associated and sector using the following Formula (D.1) .

$$B = \left(\sum_{c,\in C} \sum_{s\in S} f_{C,s} \times b^{0}_{c,s} \right) - P \qquad \text{(D.1)}$$

where

B	the remaining organization GHG budget
P	prior emissions (see Annex G)
c ∈C	2050; 2060; 2070 countries categorized based on Annex E description
s∈S	sectors based on sector categorization, e.g. IEA NZE scenario in Table E.2.1
$b^{0}_{c,s}$	organization's base year GHG emissions in country c and sector s
$f_{c,s}$	the country and sector specific budget factor f from Table E.1, E.2, E.3

If an organization cannot divide its GHG emissions into separate sectoral pathways, due to the complexity of its activities, then it can use the 'all sector' pathways in Table E.1 , Table E.2 and Table E.3 which is a global weighted average of all sectors.

D.3 Intensity based allocation using the Sectoral Decarbonization Approach (SDA)

As an alternative to absolute reduction pathways, organizations can utilize the sectoral decarbonization approach (SDA) to determine their organizational GHG budget using intensity-based reduction pathways expressed as a ratio of physical units of a specific activity (e.g. kg CO_2e/kg steel or kg CO_2e/MWh electricity). In such cases, a sectoral pathway already accounts for the projected growth of the sectoral GHG budget expressed as a physical unit of a specific activity and provides a global or regional emission reduction pathway that results in an average intensity reduction pathway.

The peer reviewed method called the Sectoral Decarbonisation Approach (SDA)[66] [67] described below can be used to determine the organizational carbon budget on the basis of its activity growth. Using the SDA approach, the organizational GHG budget B can be calculated as follows, with the IEA NZE scenario as the selected net zero pathway (base year: 2020, net zero year: t_z):

$$B = \left(\sum_{t=2020}^{t_z} GHG\ Annual\ Intensity_{t,SDA} \times CA_t \right) - P \quad \text{(D.2)}$$

where CA_t is Company Activity in year t and where the GHG annual intensity in year t is calculated using the SDA methodology as follows for a given net zero year t_z:

$$GHG\ Annual\ Intensity_{t,SDA} = (D \times P_t \times M_t) + SI_{t_z} \quad \text{(D.3)}$$

with

$$D = CI_b - SI_{t_z} \quad \text{(D.4)}$$

$$P_t = \frac{SI_t - SI_{t_z}}{SI_b - SI_{t_z}} \quad \text{(D.5)}$$

$$M_t = \frac{CA_b/SA_b}{CA_t/SA_t} \quad \text{(D.6)}$$

where

1. GHG annual intensity is the organization's required intensity between base year and long-term target year from Formula (D.3) , determined by the variables in Formula (D.4), Formula (D.5) and Formula (D.6) . Note that this is different from the organization's actual intensity, which should be multiplied by its actual activity, resulting in absolute GHG emissions. The actual reported GHG emissions of the organization should be used for tracking its performance towards its targets.

2. D in Formula (D.4) is the difference in intensity between company base year intensity versus target year intensity in the chosen sectoral net zero pathway where;

— CI_b is the organization's emission intensity in base year b, calculated per Formula (D.7) . The base year should be consistent with the base year of the selected sectoral net zero pathway (b = 2020 when using IEA pathways). Carbon CI_t intensities for year t are calculated as follows:

$$CI_t = {ce_t}/{ca_t} \quad \text{(D.7)}$$

where

— ce_t stands for organizational emissions in year t, and ca_t stands for organizational activities in year t

— SI_{t_z} is the long-term target year intensity for sectoral net zero pathway in the net zero year of the underlying scenario. Sector intensities for year t are calculated as follows:

$$SI_t = {}^{se_t}\big/_{sa_t} \quad \text{(D.8)}$$

where se_t stands for sectoral emissions in year t, and stands for sectoral activities in year t.

NOTE 1 Values for se_t can be obtained from Table E.1 , Table E.2 and Table E.3 . Values for sa_t can be obtained from sector statistics obtained with IEA NZE scenario.

3. P_t in Formula (D.5) captures the speed of the sectors' required decarbonization in the interim years between the base year and the long-term target year;

— SI_t is the interim year intensity estimated in the sectoral net zero pathway and

— SI_b is the base year intensity estimated in the sectoral net zero pathway

4. M_t in Formula (D.6) is a market share parameter in any year t between the base year and the net zero year. This variable is known between the base year and target setting year and projected for the years between the current and long-term target year. M_t is not the growth in market share, but the inverse of it.

— CA_b is Company Activity in base year b

— SA_b is Sectoral Activity in base year b

— CA_t is Company Activity in year t

— SA_t is Sectoral Activity in year t

Established organizations in some sectors can choose to use $M_t = 1$ if the projected market share is difficult to predict. For many organizations, this is a helpful simplification to predict GHG emissions for more than a decade into the future. Organizations projected to lose market share should keep $M_t = 1$ to avoid intentional attempts to gain more budget.

NOTE 2 SA_t is derived from the selected scenario's projected sectoral activity. When actual sectoral activity deviates significantly from scenario projections, the sector intensity pathway and resulting organizational budgets may require adjustment to ensure conservation of the sectoral carbon budget.

CA_t is Company Activity in year t. For target setting purposes, CA_t is based on the organization's projected activity. Organizational GHG budgets should be recalculated when actual activity data become available (see Clause F.2 , Step 5).

Organizations that operate in more than one sector can use the SDA approach to calculate separate budgets for each sector, which are then added up to obtain the organizational GHG budget .

The SDA approach can also be used with sector-specific reduction pathways for 2050, 2060 and 2070 countries (see E.3.3) if a suitable activity metric can be defined. Suitable activity metrics need to be in physical units (see 10.2).

Annex E
(informative)

Net-zero pathways based on sector and location

E.1 General

Clause 10.2 provides criteria and requirements for selecting a relevant net-zero pathway for Scope 1, 2, 3. Clause 10.2 also states that when such relevant sectoral net zero pathways do not exist or are not appropriate, the organization may use a global average net zero pathway or follow the method outlined in this Annex. Thus, the sectoral net-zero pathways described in this annex are one option that organizations can choose when setting net zero targets if they are operating or have supply chains in countries with net-zero target dates after 2050. This Annex has been developed specifically for organizations located in emerging economies that wish to set sector-specific targets that are based on IEA sector pathways with extended net-zero target dates aligned with the organization's sectoral and regional context. This Annex refers specifically to CO_2. Other GHGs are addressed in Annex G .

E.2 Sectoral pathways for 2050 countries, based on IEA

The IEA NZE scenario has a base year of 2020 and provides a sectoral breakdown of emission reduction pathways. This scenario models emission reductions for each sector in 10-year intervals between 2020 and 2050 (Table E.1). Some sectors are further divided into sub-sectors (such as Industry, with sub-sectors: iron and steel, cement and chemicals). Table E.1 also includes the implied global carbon budgets from 2020 to 2050 with a total global CO_2 budget of 460 gigatonnes for this period for these sectors. The global carbon budget on the right side of Table E.1 is estimated for this Annex with linear interpolation between 2020, 2030, 2040, 2050 CO_2 emissions based on the IEA NZE scenario.

Table E.1 also includes an example of an indicator for the budget required (ratio derived from the IEA NZE scenario by dividing the sectoral carbon budget by the sectoral pathway's base year CO_2emissions). This ratio is called budget factor f and used in Annex D.1 in allocation methodology and Clause F.2and Clause F.4 for target setting purposes. The lower this ratio, the lower the budget thus faster the sector decarbonizes.

Table E.1 — CO_2 emissions and budgets for counties with 2050 net-zero year estimated based on IEA NZE scenario (see the IEA report Net Zero by 2050 [28])

	2020[1]	2025[1,2]	2030[1]	2035[1,2]	2040[1]	2045[1,2]	2050[1]	Budget[1,3]	Factor f[4]
Electricity/ heat	**13 503**	**9 704**	**5 904**	**3 140**	**376**	**290**	**203**	**138 183**	**10,2**
Industry	**8 478**	**7 685**	**6 892**	**5 189**	**3 485**	**2 002**	**519**	**153 254**	**18,1**
Iron and steel	2 349	2 064	1 778	1319	859	540	220	40 500	17,2
Chemicals	1 296	1 248	1 199	927	654	360	66	26 021	20,1
Cement	2334	2 117	1 899	1 403	906	520	133	41 619	17,8
Transport	**7 153**	**6 436**	**5 719**	**4 203**	**2 686**	**1 688**	**689**	**127 181**	**17,8**
Road	5 483	4 780	4 077	2 935	1 793	1 067	340	90 726	16,5
Passenger Cars	2 746	2 186	1 626	1 087	547	316	85	37 301	13,6
Trucks	1721	1 668	1 614	1 252	890	544	198	35 595	20,7
Aviation	621	702	783	626	469	340	210	17 091	27,5
Shipping	800	753	705	527	348	235	122	15 601	19,5

Table E.1 *(continued)*

	2020[1]	2025[1,2]	2030[1]	2035[1,2]	2040[1]	2045[1,2]	2050[1]	Budget[1,3]	Factor f[4]
Buildings	**2 860**	**2 335**	**1 809**	**1 247**	**685**	**404**	**122**	**41 341**	**14,5**
Residential	1 968	1 673	1 377	959	541	325	108	30 598	15,5
Services	892	662	432	288	144	79	14	10 743	12,0
All sectors	**31 994**	**26 159**	**20 324**	**13 778**	**7 232**	**4 383**	**1 533**	**459 959**	**14,4**

[1] CO_2 emissions are expressed in mega tonnes (million metric tonnes) of CO_2 excluding CO_2 removals. The "other energy sector" is also excluded from this table due to its removal projection.

[2] In between years are estimated via linear interpolation.

[3] Sectoral carbon budgets are estimated by adding all estimated annual CO_2 emissions between 2020-2050.

[4]Budget factor is estimated by dividing the sectoral carbon budget by the base year emission of the sector from 2020. The budget factor f is not part of IEA NZE scenario and is estimated in this standard for target setting purposes.

For CO_2 emissions resulting from land use change, organizations should use budget factors of f=5, which corresponds to zero CO_2 emissions from land use change by 2030, and a global budget of 20,4 Gt.

E.3 Sectoral pathways for 2060 and 2070 countries

E.3.1 Identifying national net zero years

The IEA 2050 NZE scenario discussed in Clause E.2 is adjusted herein for countries that have different net zero years, which are bucketed as 2060 and 2070 net zero years, to account for the principle of equity and justice discussed in 4.9 . If the country has not defined a net zero year, its World Bank Income Category[30] is selected and a net zero year is assigned as follows:

— Set a net zero year no later than 2050 for "high income" countries

— Set a net zero year no later than 2060 for "upper middle income" countries

— Set a net zero year no later than 2070 for "lower middle income" and "low income" countries

E.3.2 Estimating sectoral pathways for countries with 2060 and 2070 targets

Once net zero years have been established, regional sector budgets can be determined based on Table E.1 , by using regional multipliers. The method outlined in the next paragraph explains how the budget factors f in Table E.2 and Table E.3 have been derived.

For countries with a 2070 net-zero year, IEA NZE model data points for 2020; 2030; 2040; 2050 are assigned at equal time intervals to 2020; 2033,3; 2046,7; 2060 respectively. Then, emissions in between 2020; 2033,3; 2046,7; 2060 are estimated by linear interpolation between those years (Table E.2). Sectoral budgets are then estimated by adding up annual estimated emissions between 2020-2060. The budget factor f is estimated by dividing each sector budget by its base year emissions in 2020 (Table E.2). For countries with a 2070 net-zero year, IEA NZE model data points for 2020; 2030; 2040; 2050 are assigned at equal time intervals to 2020; 2036,7; 2053,3; 2070 respectively. Then, emissions in between 2020; 2036,7; 2053,3; 2070 are estimated by linear interpolation between those years (Table E.3). The sectoral budgets are then estimated by adding up annual estimated emissions between 2020-2070. The budget factor f is estimated by diving each sector budget by its base year emissions in 2020 (Table E.3).

Table E.2 — Sectoral net-zero pathways for 2060 countries and their budget factor f

	2020[1]	2028[1,2]	2036[1]	2044[1,2]	2053[1]	2061[1,2]	2070[1]	Budget[1,3]	Factor f[4]
Electricity/ heat	**13 503**	**9 996**	**5 904**	**3 353**	**376**	**290**	**203**	**177 872**	**13,2**
Industry	**8 478**	**7 746**	**6 892**	**5 320**	**3 485**	**2 002**	**519**	**199 882**	**23,6**
Iron and steel	2 349	2 085	1 778	1 354	859	540	220	52 804	22,5
Chemicals	1 296	1 251	1 199	947	654	360	66	33 983	26,2
Cement	2 334	2 133	1 899	1 441	906	520	133	54 254	23,2
Transport	**7 153**	**6 491**	**5 719**	**4 319**	**2 686**	**1 688**	**689**	**165 847**	**23,2**
Road	5 483	4 834	4 077	3 023	1 793	1067	340	118 138	21,5
Passenger Cars	2 746	2 229	1 626	1 128	547	316	85	48 382	17,6
Trucks	1 721	1 672	1 614	1 280	890	544	198	46 529	27,0
Aviation	621	696	783	638	469	340	210	22 433	36,1
Shipping	800	756	705	540	348	235	122	20 378	25,5
Buildings	**2 860**	**2 375**	**1 809**	**1 290**	**685**	**404**	**122**	**53 700**	**18,8**
Residential	1 968	1 695	1 377	991	541	325	108	39 791	20,2
Services	892	680	432	299	144	79	14	13 909	15,6
All sectors	**31 994**	**26 608**	**20 324**	**14 282**	**7 232**	**4 383**	**1 533**	**597 300**	**18,7**

[1] CO_2 emissions below are expressed in mega tonnes (million metric tonnes) of CO_2 excluding CO_2 removals. The "other energy" sector is also excluded from this table due to its removal projection.

[2] In between years are estimated via linear interpolation.

[3] Sectoral carbon budgets are estimated by adding all estimated annual CO_2 emissions between 2020-2060.

[4]The budget factor is estimated by dividing the sectoral carbon budget to the base year emission of the sector from 2020. The budget factor f is not part of IEA NZE scenario and is estimated in this standard for target setting purposes.

CO_2 emissions inTable E.2 and Table E.3 represent hypothetical global carbon budgets under the assumption that all countries reach net zero by 2060 or 2070, respectively. The aggregated global carbon budget based on a distribution of 2050; 2060; and 2070 countries is discussed in the next section.

Table E.3 — Sectoral net-zero pathways for 2070 countries and their budget factor f

	2020[1]	2028[1,2]	2036[1]	2044[1,2]	2053[1]	2061[1,2]	2070[1]	Budget[1,3]	Factor f[4]
Electricity/ heat	**13 503**	**9 704**	**5 904**	**3 303**	**376**	**295**	**203**	**220 411**	**16,3**
Industry	**8 478**	**7 685**	**6 892**	**5 289**	**3 485**	**2 089**	**519**	**249 697**	**29,5**
Iron and steel	2 349	2 064	1 778	1 346	859	558	220	65 887	28,0
Chemicals	1 296	1 248	1 199	943	654	377	66	42 512	32,8
Cement	2 334	2 117	1 899	1 432	906	542	133	67 772	29,0
Transport	**7 153**	**6 436**	**5 719**	**4 292**	**2 686**	**1 746**	**689**	**207 027**	**28,9**
Road	5 483	4 780	4 077	3 002	1 793	1 109	340	147 417	26,9
Passenger Cars	2 746	2 186	1 626	1 118	547	330	85	60 234	21,9
Trucks	1 721	1 668	1 614	1 273	890	564	198	58 172	33,8
Aviation	621	702	783	635	469	347	210	28 061	45,2
Shipping	800	753	705	537	348	242	122	25 447	31,8
Buildings	**2 860**	**2 335**	**1 809**	**1 280**	**685**	**420**	**122**	**66 902**	**23,4**
Residential	1 968	1 673	1 377	984	541	337	108	49 618	25,2

Table E.3 *(continued)*

	2020[1]	2028[1,2]	2036[1]	2044[1,2]	2053[1]	2061[1,2]	2070[1]	Budget[1,3]	Factor f[4]
Services	892	662	432	296	144	83	14	17 284	19,4
All sectors	**31 994**	**26 159**	**20 324**	**14 163**	**7 232**	**4 550**	**1 533**	**744 036**	**23,3**

[1] CO_2 emissions below are expressed in mega tonnes (million metric tonnes) of CO_2 excluding CO_2 removals. The "other energy" sector is also excluded from this table due to its removal projection.

[2] In between years are estimated via linear interpolation.

[3] Sectoral carbon budgets are estimated by adding all estimated annual CO_2 emissions between 2020-2060.

[4]The budget factor is estimated by dividing the sectoral carbon budget to the base year emission of the sector from 2020. The budget factor f is not part of IEA NZE scenario and is estimated in this standard for target setting purposes.

The organization should select a representative sector for the organization's operations. Organizations can start by considering the lowest sub-sector level, for example, passenger cars. If this level if not representative of their operations, then they select a higher level in the hierarchy in the same sector, for example, road transport. If not, then they can align to the main sector level, for example, transport. If an organization does not fit into the sector and sub-sectors noted in Table E.1 , Table E.2 and Table E.3 then the organization should use "all sectors" in Table E.1, Table E.2 and Table E.3 based on where they operate or have value chains. Organizations should justify how the sector they select is representative of their operations.

The Agriculture, Forestry, and Other Land Uses (AFOLU) sector are not covered by IEA sector pathways. For land-use based CO_2 emissions, the average values for "all sectors" in Table E.1 , Table E.2 and Table E.3 should be used for 2050; 2060; 2070 countries. Annex G G also discusses how to set separate targets for methane and nitrous oxide (where applicable).

E.3.3 Calculating the global carbon budget and estimated global temperature rise

Table E.1 , Table E.2 and Table E.3 provide estimated GHG emissions and budget as if all counties end up in 2050, 2060, 2070 net-zero year, respectively. However, based on the commitment of each country to a specific net-zero year as discussed in Annex E.3.1, the global carbon budget is estimated by multiplying base year CO_2 emissions of countries with 2050, 2060 and 2070 net-zero year with corresponding budget f factor from all sectors (14,4; 18,7 and 23,3 respectively) and adding them up. This results in a global carbon budget of 570 gigatonnes (Gt) (see Table E.4 for more details) excluding land use change.

Table E.4 — The global carbon budget estimated based on 2050, 2060, 2070 countries distribution

Net-zero year for the country	Country group total base year CO_2 emissions, mega-tonnes	Budget factor f (from Tables E.1,2,3)	Carbon budget per 2050, 2060, 2070 countries, gigatons (Gt)
2050	12 012	14,4	173 (= (12 012 × 14,4)/1000)
2060	14 845	18,7	277 (= (14 845 × 18,7)/1000)
2070	5 137	23,3	120 (= (5 137× 23,3)/1000)
Total global carbon budget, gigatonnes CO_2 >>>>>>			**570 (sum of numbers above)**

A global carbon budget of 570 Gt from 2020 corresponds to limiting peak warming to approximately 1,57°C above pre-industrial levels with 50% probability (including the AFOLU sector). For a 50% probability, the expected temperature rise ΔT can be calculated from the global carbon budget B using Formula (E.1) .

$$\Delta T = 1,207°C + 0.000587°C/Gt \times B \quad \text{(E.1)}$$

The underlying data correspond to IPCC AR6 WG1, Table SPM2.[35]

Annex F
(normative)

Setting greenhouse gas emission reduction targets

F.1 General

Organizations should follow the steps described below to set GHG emissions reduction targets. Practical examples are covered in Clause F.4 and Clause F.5 .

F.2 Setting greenhouse gas emission reduction targets for Scope 1 based on an organizational greenhouse gas budget

Step 1: The organization establishes a base year for Scope 1

— The base year chosen by the organization should be the same year as the base year of its selected net zero pathway .

— If an organization selects a base year that is later than the base year of its selected net zero pathway, then adjustments in the organizational GHG budget should be made to account for prior emissions when defining the organizational GHG budget for Scope 1 (Step 3).

Step 2: The organization calculates prior emissions

— Organizations should calculate their Scope 1 GHG emissions according to Clause 8 for the period between 2020 and the target setting year, which are called prior emissions, according to the following steps:

— If primary data on prior emissions for Scope 1 are available, these data should be used.

— If not, organizations should use statistical data that are available for GHG emissions for both the sector and for the country in which they operate. For many sectors, these data can be found in the EDGAR dataset [68]

— If no such data are available, use global sectoral emission data, for example from the IEA NZE model

— If no global sector data are available, use national averages that do not differentiate between sectors

— If no national data are available, use global emission data that do not differentiate between sectors

When using statistical data, the following Formula (F.1) should be used to estimate prior emissions:

$$e\left(t\right) = e_r \times \frac{E(t)}{E_r} \quad \text{(F.1)}$$

— where *e (t)* stands for organizational emissions in year *t*; e_r stands for organizational emissions in the target setting year; *E(t)* stands for statistical emissions in year *t*; and E_r stands for statistical emissions in the most recent year.

— If prior emission data do not go back all the way to base year , organizations should use organizational data that go back as far as possible, and use the approach outlined above to fill gaps until the base year .

— If data are not available for the target setting year, organizations should use linear extrapolation across the last 10 available data points to estimate emissions for the target setting year.

— Organizations operating in multiple countries with different net-zero years or in multiple sectors should calculate the target setting year organizational greenhouse gas emissions for each combination of net zero year and sector.

Step 3: The organization identifies a net zero target year for all countries in which it operates

— Organizations should identify the net zero target year of the country in which they operate to set long term net-zero targets for Scope 1, for example by consulting national legislation or by reviewing the database at https://zerotracker.net/[69], using either "net zero" or "climate neutral" dates.

— If the country has not defined a net zero year, the organization should identify its net zero year by the most recent World Bank Income category[30] of the country and assign a net zero year as noted in Annex E (2050 for "high income" countries, 2060 for "upper middle income" countries, 2070 for "lower middle income" and "low income" countries)

Step 4: The organization determines its total organizational GHG budget for Scope 1;

— The organization should determine its total organizational CO_2 budget for Scope 1 emissions, aligned with its selected net zero pathway , using a peer reviewed allocation method (see Annex D and examples below in Clause F.4 and Clause F.5).

— If the organization has significant emissions of non-CO_2 GHGs, the budget for these GHGs should be determined according to Annex G .

— The organizational GHG budget should be calculated by adding the organizational CO_2 budget and the organizational non CO_2 budgets, expressing the result in CO_2 equivalents.

NOTE 1 Anticipated residual emissions based on the relevant net-zero pathway are also considered when calculating the organizational GHG budget for Scope 1.

Step 5: The organization sets interim and long-term GHG emission reduction targets for Scope 1

Once an organization has determined its organizational GHG budget , it is free to define a reduction pathway that stays within that budget.

— the organization should separate the organizational GHG budget (cumulative GHG emissions between organization's base year and net-zero year) into interim budgets that are no more than 5 years apart from first interim target then not more than 10 years apart from following interim targets.

— Once the organizational GHG budget is separated into first 5, then 10 years intervals, then interim and long term GHG emission reduction targets should be set in a way that fits the organization's transition plan.

— If assumptions are made to derive GHG emission reductions on the basis of the SDA method, the GHG emission reduction pathway should be adjusted annually to account for differences between projections and actual activity, both for the organization and for the sector. This includes recalculating the organizational GHG budget organizational GHG budget using actual CA_t values as they become available [67] have proposed various approaches for pathway realignment.

— When tracking performance against the organizational GHG budget , organizations in countries with a 2050 net zero year should cap $M_t \leq 1$ (Formula (D.2)) in Clause D.2), so that a declining market share relative to the global sectoral average does not result in a less stringent intensity requirement. For organizations in countries with 2060 or 2070 net zero years, M_t may reflect actual market share changes of $M_t \geq 1$ (Formula (D.2)) in Clause D.2), so that below-average growth relative to the global sectoral average results in appropriate treatment in the intensity reduction requirement.

Step 6: The organization's cumulative GHG emissions until the net zero year stay within the organizational GHG budget:

— The organization's reported cumulative GHG emissions for Scope 1 should be equal to or less than the interim GHG budgets at each interim target .

— If Scope 1 GHG emissions overshoot an interim budget target in any interim target year after the base year , 16.6.5 sets out the actions needed to remain within the organizational budget by its next interim target year.

Step 7: The organization operating in more than one country (multi-national) determines its net-zero year for Scope 1:

— A multi-national organization should calculate its Scope 1 net zero year as a weighted average using the following Formula (F.2) :

$$\text{Net zero year} = \frac{e(2050) \times 2050 + e(2060) \times 2060 + e(2070) \times 2070}{e(2050) + e(2060) + e(2070)} \quad \text{(F.2)}$$

— where e(2050), e(2060) and e(2070) stand for the combined emissions from all activities in 2050, 2060 and 2070 countries, respectively.

NOTE 2 The net-zero year is rounded to the nearest integer. Organizations that are active in more than one country or more than one location do not have to choose between 2050, 2060 and 2070. They can set a net zero year that is earlier than the calculated net zero year.

NOTE 3 Whenever possible, the net-zero year should be calculated based on Formula (F.2) , using base year emissions (e.g. 2020). When this is not possible, the organization can use the most recent year for which data are available.

F.3 Setting greenhouse gas emissions reduction targets for Scope 2 and 3

To set Scope 2 GHG emission reduction targets, organizations should select pathways that adequately describe the electricity grid in which they operate. National net-zero pathways are usually readily available for the electricity sector. If not, organizations can use budget factors f for the electricity/heat sector or follow the pathway from Table E.1, Table E.2 and Table E.3 for the electricity sector based on where they operate. If a budget factor f is used, then steps noted above for Scope 1 can be also applied to Scope 2 target setting.

To set Scope 3 GHG emission reduction targets, organizations should use pathways that are appropriate for the sectors in which relevant emissions are generated. Organizations can use sectoral pathways from Table E.1, Table E.2 and Table E.3and budget factors from Table E.1, Table E.2 and Table E.3 while taking both the sectoral and the regional context into account. If Scope 3 emissions occur in more than one sector, pathways for different sectors should be combined, reflecting the relative magnitude of the different sectors. Thus, composite Scope 3 pathways can be constructed using pathways from Table E.1, Table E.2 and Table E.3. Organizations with complex upstream value chains that cover a large diversity of sectors can use sectoral pathways and the budget factors for “all sectors” from Table E.1, Table E.2 and Table E.3.

F.4 Example for budget factor f use for Scope 1

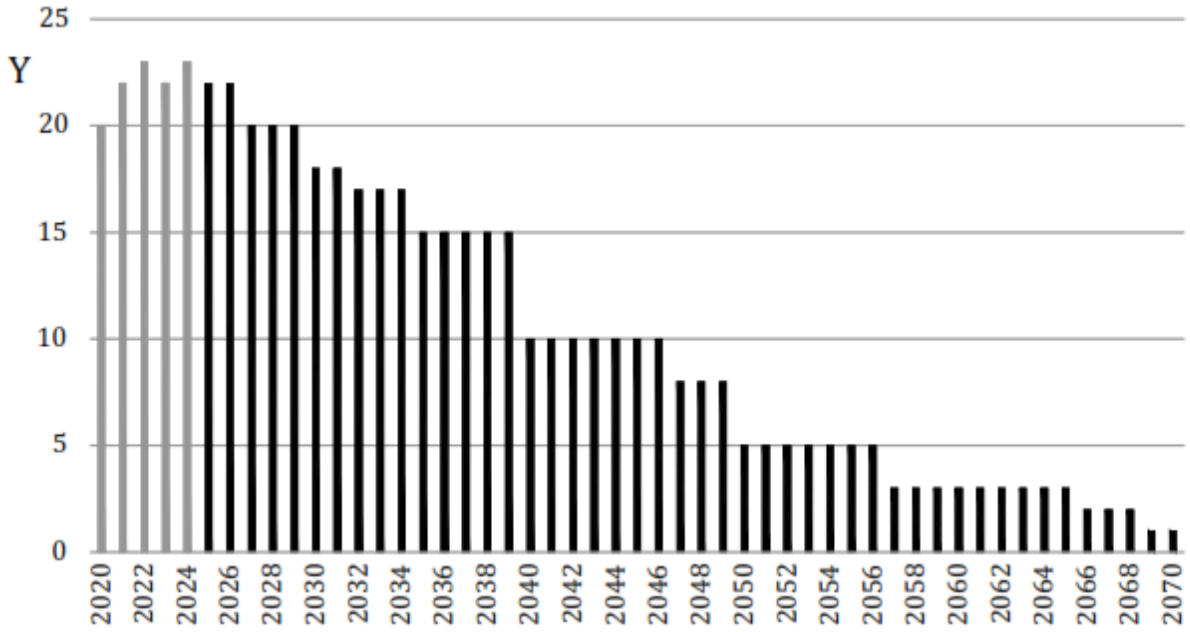
In this example, a hypothetical multi-national organization producing steel has direct emissions/Scope 1 emissions of 22 mega tonnes (million metric tonnes) CO_2 in the base year (2020) of which 10 and 11 megatonnes CO_2 are from its operations in 2060 and 2070 countries, respectively and 12 industrial sectors, and 9 megatonnes CO_2 from its operations in the transport sector (see Table F.1 below). The organization can estimate its organizational GHG budget using the Formula (D.1) in Clause D.2.

Table F.1 — Example of how the Organizational GHG budget for Scope 1 is calculated for a multi-national steel making organization between 2020-2070

Sector (excluding CO_2 removals)	Megatonne CO_2 in 2020 for Scope 1 emitted in 2060 country	Budget factor f for 2060 country	Megatonne CO_2 in 2020 for Scope 1 emitted in 2070 country	Budget factor f for 2070 country
Industry: Iron and steel	4,0	22,5	8,0	28,0
Transport	6,0	23,2	3,0	28,9
Total emissions in each country	10,0		11,0	
Prior emissions between 2020-2024	50,0		60,0	
Organizational GHG budget for Scope 1 between 2025-2070	**430 megatonnes CO_2 calculated based on [(4*22,5 + 6*23,2 + 8*28,0 + 3*28,9) – (50+60)]**			

In such a case, the total organizational GHG budget between 2020-2070 for Scope 1 is estimated as 540 megatonnes CO_2 ([4*22,5 + 6*23,2 + 8*28,0 + 3*28,9], Table F.1). However, taking account of the 110 megatonnes CO_2 ([50+60] in 2060 and 2070 countries, Table F.1) emitted since the organization's base year (2020-2024), also known as prior emissions, the remaining organizational GHG budget between 2025-2070 is 430 megatonnes CO_2 ([540-110], Table F.1) according to Formula (F.2) .

This hypothetical organization should separate the organizational GHG emission budget (2025-2070) into interim GHG target windows (such as 2025-2030, 2030-2040, 2040-2050, 2050-2060, 2060-2070). Following the example, an organizational GHG budget between 2025-2070 (430 megatonnes CO_2) can be sub-divided to align with the organization's transition plan, in a stepwise approach based its investment strategy. For this hypothetical example, where there is an organizational GHG budget of 430 megatonnes CO_2 for Scope 1 emissions, Figure F.1 illustrates the GHG emission per year separated into 122, 154, 89, 42, 23 megatonnes CO_2 between 2025-2030, 2030-2040, 2040-2050, 2050-2060 and 2060-2070, respectively. GHG emission reduction targets are set as 18, 10, 5, 3, 1 megatonnes CO_2 for 2030, 2040, 2050, 2060, 2070 respectively.



Key

Y Megatonne CO_2 emissions

Figure F.1 — Example for an organization that is setting GHG emission reduction targets based on an organizational GHG budget for Scope 1 between 2020-2070. Gray bars between 2020-2024 are prior emissions of 110 megatonnes CO_2. The remaining 430 megatonnes CO_2 is separated into annual emissions that are aligned to the organization's transition plan.

F.5 Example for SDA-based targets for Scope 1

The following example relates to hypothetical companies A and B producing electricity in a 2050 country using an SDA allocation method to estimate their GHG emission reduction target. Details of the calculation for the intensity-based, estimated GHG emissions for each company A and B compared to the IEA net zero by 2050 model, are shown in Table F.2 where formulae D.2 - D.8 from Clause D.3 are applied to estimate 2030 and 2040 intensity and GHG emissions. In this example M_t for Company A is greater than 1, but it is set to 1 instead of what is projected, to align with the recommendation noted in Clause F.3 . The intensity pathways for both company A and B are compared to the intensity pathway of the electricity sector calculated from IEA NZE scenario in Figure F.2 .

The organizational GHG budget can be estimated by summing the projected GHG emissions for each year, calculated by multiplying the target GHG emissions intensity for the organization in each year between the base-year and the long-term target year by the unit of activity data used in the denominator of the intensity target presented in Formula (F.2) from Annex F.2. Following the example shown in Table G.3 , for company A, the organizational GHG budget is estimated between 2020-2050 for Company A and B as 786 and 117 megatonnes CO_2, respectively. These organizational GHG budgets then can be separated into 5-10 years intervals using the similar logic illustrated in Figure G.1 , aligned with organization's transition plan.

Table F.2 — Intensity-based IEA net-zero model by 2050. IEA Report Net Zero by 2050. [28]

	year>>	2020	2030	2040	2050

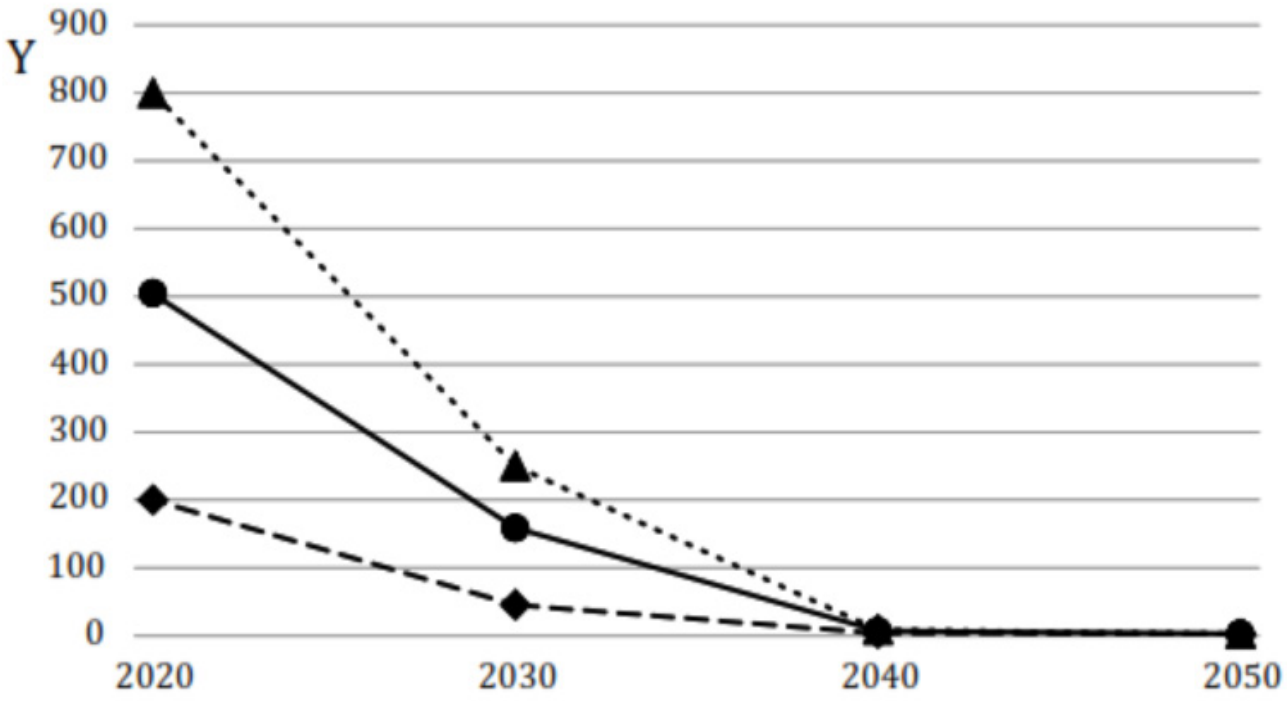
Table F.2 *(continued)*

IEA net-zero by 2050 model for electricity sector	Sectoral activity (electricity), SA_t, TWh	26,778 (SA_b)	37,316	56,553	71,164
	Electricity emissions (excluding removal), Megatonne CO_2	13,503	5,904	376	203
	SI_b, SI_{t_z}, SI_t, kg CO_2e/MWh	504 (SI_b)	158 (SI_t)	7 (SI_t)	3 (SI_{2050})
	$P_t = (SI_t - SI_{t\_z})/(SI_b - SI_{t\_z})$	100%	31%	1%	0%
Company specific estimates	M_t for Company A[1]	1.00	1.00 (1.16)	1.00 (1.41)	1.00 (1.48)
	Company A, electricity intensity[2], CI_b kg CO_2e/MWh	800	250	9	3
	M_t for Company B	1.00	0.70	0.70	0.66
	Company B, electricity intensity[2], CI_b, kg CO_2e/MWh	200	45	4	3
	Company A, electricity production[2], CA_t, TWh	100 (CA_b)	120	150	180
	Company B, electricity production[2], CA_t, TWh	50 (CA_b)	100	150	200
	Company A, Electricity emissions[2], Megatonne CO_2	80	30	1	1
	Company B, Electricity emissions[2], Megatonne CO_2	10	5	1	1

[1] M_t is capped at 1.0 to avoid situations where companies project to lose to market share to gain more organizational GHG budget.

[2] Base year 2020 emission are actual but other interim years (2030, 2040) are estimated based on formulae (4-8). Long term year intensity (2050) is assumed to converge with the sector's long term target intensity for each company.

While an organization's projected activity data can be used for target-setting, the organization should adjust the organizational GHG budget based on actual company and sector activity data as these data become available periodically, for example every year.



Key

Y kg CO_2e/MVh electricity

Figure F.2 — Intensity-based target-setting for hypothetical Companies A and B compared to the IEA net-zero by 2050 model electricity sector average.

Annex G
(informative)

Reduction targets for individual greenhouse gases

Clause 10.3 specifies that organizations having material emissions for methane, nitrous oxide or HFCs in their scope 1 emissions should set separate reduction targets for these GHGs that reflect the highest possible ambition for reductions available to that organization . This annex provides guidance based on the IPCC [70] AR6 Scenario Explorer and Database, using scenarios that would have limited warming to 1,5°C with no or limited overshoot if immediate global action to reduce emissions had been taken from 2020 onwards [Byers, E., Krey, V., Kriegler, E., Riahi, K., Schaeffer, R., Kikstra, J.S., Lamboll, R., Nicholls, Z.R., 2022] AR6 Scenarios Database [70] .

These scenarios reflect those that were submitted to the IPCC emissions scenario database for the IPCC AR6 and passed a vetting procedure (see IPCC 2022: Annex III: Scenarios and modelling methods [Guivarch, C., et. al. (eds)] . In IPCC, 2022: Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [P.R. Shukla, J. Skea, R. Slade, et. al. (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926.022

These scenarios provide some guidance on global pathways that can be seen as “reflecting the highest possible ambition”, but they should be interpreted with care. They reflect results from global integrated assessment modelling teams, with model specific assumptions about mitigation options and their effectiveness over the 21st century. Results in many of these scenarios reflect least-cost emission abatement options globally, and most do not make explicit assumptions about global equity or environmental justice. For some sectors and some gases, the number of scenarios is limited and sector-and region-specific results reflect these model inputs and assumptions.

For methane and nitrous oxide, data are provided for the three most relevant sectors for each gas, as the number of 1,5-aligned pathways for other sectors is too limited to provide robust and comprehensive information for all sectors. Scenarios for F-gases comprise emissions of HFCs, PFCs and SF6; these are shown gases without differentiating between sectors given their common abatement options.

This Annex presents modelling results for global average reductions, but organizations should take their individual and their regional context into account when setting organizational targets for individual greenhouse gases: a smallholder who grows rice in a low-income country will have different options and a different ability to pay for mitigation measures than an intensive cattle farmer in a high-income country.

Organizations with operations located in advanced industrial economies, or with high financial capacity or abatement opportunities, generally should aim for significantly more rapid and deeper abatement than the results reported below for the global average, and explain how their organizational gas-specific abatement targets are consistent with and support achievement of these global reductions in the context of equity.

Once a reduction pathway has been defined, an organizational budget can be calculated for each gas by adding up the annual target emissions between the base year and 2050. For years for which no data are provided, interpolation may be used. The results should be expressed as CO_2 equivalents.

NOTE The resulting budgets for these gases already reflect the highest possible ambition for reduction available to that organization, and hence already reflect regional differences. Therefore there is no need to use regional multipliers.

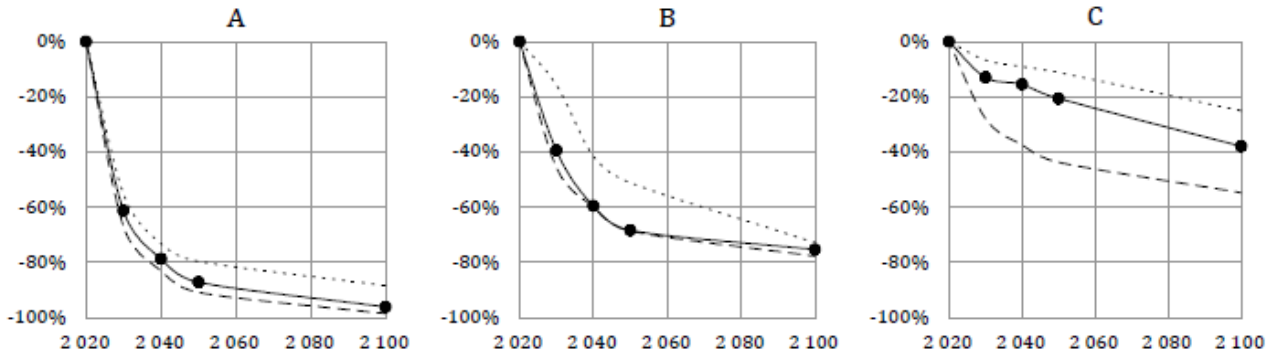
Methane

In the case of methane the three most important sectoral sources are agriculture, energy and waste. It is important to distuinguish between methane emissions from the AFOLU sector (Agriculture, Forestry and Other Land Uses) and from the energy and waste sectors, as abatement potentials differ significantly between those sectors, especially in the near term. Note that most integrated assesment models report

emissions for methane from AFOLU and energy, but only 29 AR6 scenarios are available for the waste sector, so that data are less robust than for the other two sectors. (see Table G.1)

Table G.1 — Median methane reduction pathways based on AR 6 scenarios (from a total of 97 scenarios that limit warming to 1,5°C with no or limited overshoot)

	N	2020	2030	2040	2050	2100
Energy	78	0%	-61%	-79%	-87%	-96%
Waste	29	0%	-39%	-60%	-68%	-75%
AFOLU	84	0%	-13%	-15%	-21%	-38%



Key

A	Energy
B	Waste
C	AFOLU
_____	median
. . . . .	75th percentile
- - - - - - -	25th percentile

Figure G.1 — Sectoral methane reduction pathways based on AR 6 scenarios

From these data it is clear that, on average, methane emissions occurring in the energy sector and in the waste sector should be reduced significantly faster and more deeply than emissions occurring in the AFOLU sector.

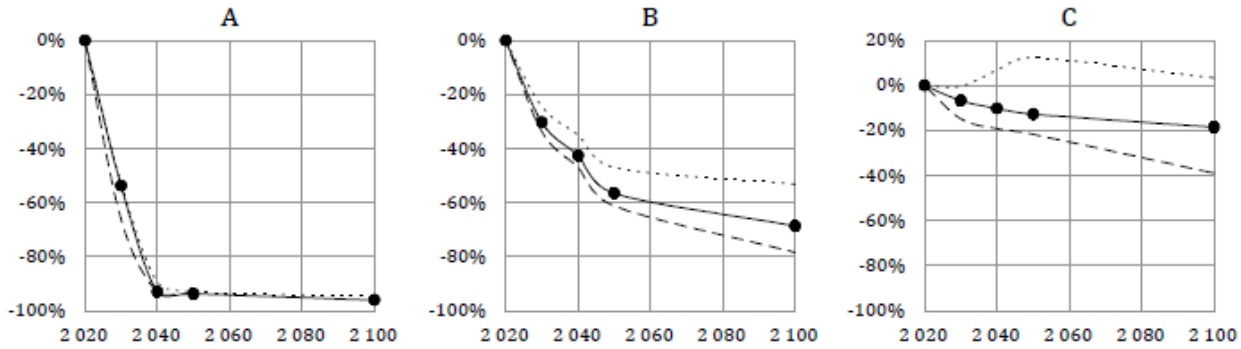
Methane reduction targets should be at least as ambitious as national methane action plans compiled by the Climate and Clean Air Coalition[71] .

Nitrous Oxide

For nitrous oxide the three most important sectors are AFOLU, industrial processes and energy, with global average reductions shown below. (seeTable G.2)

Table G.2 — Median nitrous oxide reduction pathways based on AR 6 scenarios

	N	2020	2030	2040	2050	2100
Industrial Processes	32	0%	-54%	-93%	-94%	-96%
Energy	73	0%	-30%	-43%	-57%	-69%
AFOLU	84	0%	-7%	-10%	-13%	-18%



A Industrial Processes
B Energy
C AFOLU
_____ median
. . . . . 75^{th} percentile
- - - - - - - 25^{th} percentile

Figure G.2 — Nitrous oxide reduction pathways based on AR 6 scenarios

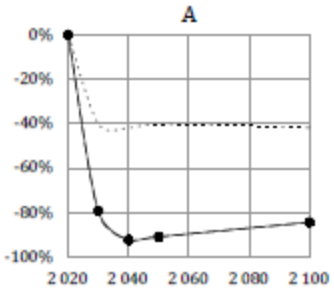
From these data it is clear that on average, nitrous oxide emissions occurring in the industrial and energy sectors should be reduced much more rapidly and deeply than emissions occurring in the AFOLU sector. (See Figure G.2)

F-Gases

Fluorinated gases (F-gases) include hydrofluorocarbons (HFCs), per fluorocarbons (PFCs) and sulphur hexafluoride (SF6). Organizations emitting F-gases should reduce F-gas emissions aggressively, reaching a reduction of approximately 80% by 2030 in the global average. These rapid reductions should be achieved irrespective of the sector in which the organization operates. (See Table G.3 andFigure G.3)

Table G.3 — Median F-gas reduction pathways based on AR 6 scenarios

	N	2020	2030	2040	2050	2100
F-gases	89	0%	-77%	-85%	-88%	-85%



Key
A F-Gases
_____ median
. . . . . 75^{th} percentile

Figure G.3 — F-gas pathways based on AR 6 scenarios

$$GHG\ Annual\ Intensity_{t,SDA} = (D \times P_t \times M_t) + SI_{t_z} \quad \text{(G.1)}$$

$$P_t = \frac{SI_t - SI_{t_z}}{SI_b - SI_{t_z}} \quad \text{(G.2)}$$

$$D = CI_b - SI_{t_z} \quad \text{(G.3)}$$

$$GHG\ Annual\ Intensity^{t,SDA} = (D \times Pt \times Mt) + SI^{2050} \quad \text{(G.4)}$$

$$M_t = \frac{CA_b/SA_b}{CA_t/SA_t} \quad \text{(G.5)}$$

$$\left(Organizational\ GHG\ budget\right)^{2020-2050} = \sum_{t=2020}^{t=2050} GHG\ Annual\ Intensity^{t,SDA} * CAt \quad \text{(G.6)}$$

Bibliography

[1] LEE, H and ROMERO, J (eds.). Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change IPCC, Geneva, Switzerland, pp. 35-115, 2023. DOI: 10.59327/IPCC/AR6-9789291691647. Available from: https://www.ipcc.ch/report/ar6/syr/

[2] The Paris Agreement. Online. United Nations Framework Convention on Climate Change (UNFCCC), 2015. Available from: https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement [viewed 2022-09-17].

[3] Integrity Matters: Net Zero Commitments by Businesses, Financial Institutions, Cities and Regions. Online. United Nations (UN), 2023. Available from: https://www.un.org/en/climatechange/high-level-expert-group

[4] IWA 42:2022, *Net zero guidelines*

[5] ISO 14064-2:2019, *Greenhouse gases — Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements*

[6] ISO 14064-3:2019, *Greenhouse gases — Part 3: Specification with guidance for the verification and validation of greenhouse gas statements*

[7] ISO 14067:2018, *Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification*

[8] ISO/TS 14064-4:2025, *Greenhouse gases — Part 4: Guidance for the application of ISO 14064-1*

[9] Greenhouse Gas Protocol (GHGP): A Corporate Accounting and Reporting Standard. Online. World Resources Institute (WRI) & World Business Council for Sustainable Development (WBCSD), 2004. Available from: https://ghgprotocol.org/corporate-standard

[10] Greenhouse Gas Protocol (GHGP): Scope 2 Guidance. Online. World Resources Institute (WRI) & World Business Council for Sustainable Development (WBCSD), 2015. Available from: https://ghgprotocol.org/scope-2-guidance

[11] Greenhouse Gas Protocol (GHGP): Corporate Value Chain (Scope 3) Accounting and Reporting Standard. Online. World Resources Institute (WRI) & World Business Council for Sustainable Development (WBCSD), 2011. Available from: https://ghgprotocol.org/corporate-value-chain-scope-3-standard

[12] ISO 14068-1:2023, *Climate change management — Transition to net zero — Part 1: Carbon neutrality*

[13] ISO/FDIS 32212, *Sustainable finance — Net zero transition planning for financial institutions*

[14] MASSON-DELMOTTE, V. et al. (eds.). Annex VII: Glossary [Matthews, J.B.R. et al. (eds.)]. In: Climate change 2021: The physical science basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). Cambridge: Cambridge University Press, 2021, pp. 2215–2256. DOI 10.1017/9781009157896.022. Available from: https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_AnnexVII.pdf

[15] IPCC 2019, Refinements of Guidelines for National Greenhouse Gas Inventories Available from: https://www.ipcc.ch/report/2019-refinement-to-the-2006-ipcc-guidelines-for-national-greenhouse-gas-inventories/

[16] VAN DIEMEN, R. et al. (eds.). Annex I: Glossary. In: Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). Cambridge: Cambridge University Press, 2022. DOI:

10.1017/9781009157926.020. Available from: https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_Annex-I.pdf

[17] ISO 14050:2020, *Environmental management — Vocabulary*

[18] ISO 22095:2020, *Chain of custody — General terminology and models*

[19] ISO/FDIS 14021, *Environmental statements and programmes for products — Self-declared environmental claims*

[20] United Nations Framework Convention on Climate Change (UNFCCC). Marrakesh Ministerial Declaration. Online. Marrakesh: UNFCCC, 2001. Available from: https://unfccc.int/sites/default/files/resource/docs/cop7/13a01.pdf

[21] ISO 14001:2026, *Environmental management systems — Requirements with guidance for use*

[22] ISO/IEC 20246:2017, *Software and systems engineering — Work product reviews*

[23] Greenhouse Gas Protocol (GHGP): Product Life Cycle Accounting and Reporting Standard. Online. World Resources Institute (WRI) & World Business Council for Sustainable Development (WBCSD), 2011. Available from: https://ghgprotocol.org/sites/default/files/standards/Product-Life-Cycle-Accounting-Reporting-Standard_041613.pdf

[24] Guiding Principles on Business and Human Rights. United Nations (UN), 2011. Available from: https://www.ohchr.org/sites/default/files/Documents/Publications/GuidingPrinciplesBusinessHR_EN.pdf

[25] ILO's Tripartite Declaration of Principles. Available: from https://www.ilo.org/about-ilo/organizational-structure-international-labour-office/ilo-department-sustainable-enterprises-productivity-and-just-transition/tripartite-declaration-principles-concerning-multinational-enterprises-and

[26] Organisation for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises on Responsible Business Conduct. Online. OECD, 2023. Available from: https://mneguidelines.oecd.org/mneguidelines/

[27] GRI 102: Climate Change: 102-1 Transition plan for climate change mitigation Available from: https://www.globalreporting.org/media/rg4l23do/item-06-gri-topic-standard-for-climate-change-2025.pdf

[28] International Energy Agency (IEA) Report: Net Zero by 2050. Online. IEA, 2021. License: CC by 4.0. Available from: https://www.iea.org/reports/net-zero-by-2050

[29] SHUKLA, P. R. et al. (eds.). Summary for policymakers. In: Climate change 2022: Mitigation of climate change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). Cambridge: Cambridge University Press, 2022. DOI: 10.1017/9781009157926.001. Available from: https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_FullReport.pdf

[30] World Bank. World Bank country classifications by income level for 2024–2025. Online. Washington, DC: World Bank, 2024. Available from: https://blogs.worldbank.org/en/opendata/world-bank-country-classifications-by-income-level-for-2024-2025

[31] GUIVARCH, C. et al. (eds.). Annex III: Scenarios and modelling methods. In: Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). Cambridge: Cambridge University Press, 2022, p. 1877. DOI: 10.1017/9781009157926.022. Available from: https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_Annex-III.pdf

[32] Intergovernmental Panel on Climate Change (IPCC) 1,5 C Special Report: Global warming of 1,5°C. Online. IPCC, 2018. Available from https://www.ipcc.ch/sr15/

[33] One Earth Climate Model: Sectoral pathways to net-zero emissions. Online. UNEP Finance Initiative (UNEPFI), 2022. Available from: https://www.unepfi.org/industries/investment/one-earth-climate-model-sectoral-pathways-to-net-zero-emissions/

[34] EN 18074:2025, *Industrial decarbonization - Requirements and guidelines for sectoral transition plans*

[35] MASSON-DELMOTTE, V. et al. (eds.). Summary for policymakers. Table SPM.2. In: Climate change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). Cambridge: Cambridge University Press, 2021. DOI: 10.1017/9781009157896

[36] ISO 50001:2018, *Energy management systems — Requirements with guidance for use*

[37] Engaging Supply Chains on the Decarbonization Journey. Science Based Targets initiative (SBTi), version 1.1. July 2025. Available from: https://files.sciencebasedtargets.org/production/files/Supplier-Engagement-Guidance.pdf

[38] Catalysing climate action: The role of professional service providers. Online. Race to Zero, 2024. Available from: https://www.climatechampions.net/media/qoain5cs/catalysing-climate-action-the-role-of-professional-service-providers-in-realizing-a-net-zero-future.pdf

[39] Climate Solutions Framework. Online. Exponential Roadmap, n.d., Available from: https://exponentialroadmap.org/climate-solutions-framework/

[40] Net Zero Investment Framework. Online. Institutional Investors Group on Climate Change (IIGCC), n.d. Available from: https://www.iigcc.org/net-zero-investment-framework/

[41] Climate Champions: 2030 Breakthroughs. Race to Zero, 2026. Available from: https://www.climatechampions.net/frameworks/breakthroughs/

[42] ISO 13391-1:2025, *Wood and wood-based products — Greenhouse gas dynamics — Part 1: Framework for value chain calculations*

[43] Guidance on Avoided Emissions v2.0: Drive Innovations and Scale Solutions Toward Net Zero. Online. World Business Council for Sustainable Development (WBCSD), 2025. Available from: https://www.wbcsd.org/resources/guidance-on-avoided-emissions-helping-business-drive-innovations-and-scale-solutions-towards-net-zero/

[44] Funding Beyond Value Chain Mitigation. Online. Gold Standard, 2024. Available from: https://goldstandard.cdn.prismic.io/goldstandard/ZfhQ7smUzjad_Ut-_BeyondValueChainMitigationReportMarch2024.pdf

[45] Above and beyond: An SBTi report on the design and implementation of beyond value chain mitigation (BVCM). Version 1.0. Online. Science Based Targets initiative (SBTi), 2024. Available from: https://sciencebasedtargets.org/resources/files/Above-and-Beyond-Report-on-BVCM.pdf

[46] The case for beyond value chain actions. Online. World Business Council for Sustainable Development (WBCSD), 2024. Available from: https://www.wbcsd.org/wp-content/uploads/2024/04/WBCSD_Beyond-Value-Chain-Actions_final.pdf

[47] Climate Contributions for People and Nature. Online. WWF Switzerland, 2025. Available from: https://www.wwf.ch/sites/default/files/doc-2025-06/WWF%20Climate%20%26%20Nature%20Contributions%20Report_FINAL.pdf

[48] Claims Code of Practice. Version 3.0. Online. Voluntary Carbon Markets Integrity Initiative (VCMI), 2025. Available from: https://vcmintegrity.org/vcmi-claims-code-of-practice/

[49] Framework for responsible policy engagement. Online. We Mean Business Coalition, 2023. Available from: https://www.wemeanbusinesscoalition.org/rpe2/

[50] The AAA Framework for Climate Policy Leadership: A Guide for Companies. Online. Environmental Defense Fund (EDF), 2023. Available from: https://www.edf.org/sites/default/files/2023-10/AAA%20Framework%20Guide%20for%20Companies%2011x17.pdf

[51] Climate Champions: 5th P (Persuade) Handbook. Online. Race to Zero, n.d. Available from: https://www.climatechampions.net/media/jzra4dzg/race-to-zeros-5th-p-persuade-handbook-2.pdf

[52] CAFA's Best Practice Framework for Associations Available from: https://www.climateactionforassociations.org/resources/best-practice-framework

[53] The 17 goals: Sustainable Development. United Nations (UN), n.d. Available from: https://sdgs.un.org/goals

[54] Guiding Principles on Business and Human Rights. United Nations (UN), 2011. Available from: https://www.ohchr.org/sites/default/files/Documents/Publications/GuidingPrinciplesBusinessHR_EN.pdf

[55] ISO 17298:2025, *Biodiversity — Considering biodiversity in the strategy and operations of organizations — Requirements and guidelines*

[56] Task Force on Nature-related Financial (TFNFD) Disclosures. Available from: https://tnfd.global/ [viewed 2022-09-17].

[57] The first science-based targets for nature. Online. Science Based Targets Network (SBTN), n.d. Available from: https://sciencebasedtargetsnetwork.org/how-it-works/the-first-science-based-targets-for-nature/

[58] ISO/UNDP PAS 53002:2024, *Guidelines for contributing to the United Nations Sustainable Development Goals (SDGs)*

[59] ISO 26000:2010, *Guidance on social responsibility*

[60] Regulation (EU) 2024/3012 of the European Parliament and of the Council of 11 December 2024 establishing a Union Certification Framework for carbon removals. Online. Official Journal of the European Union. European Union (EU), 2024. Available from: https://eur-lex.europa.eu/eli/reg/2024/3012/oj

[61] ISO 14064-3, *Greenhouse gases — Part 3: Specification with guidance for the verification and validation of greenhouse gas statements*

[62] ISO/IEC 17029:2019, *Conformity assessment — General principles and requirements for validation and verification bodies*

[63] ISO 14065, *General principles and requirements for bodies validating and verifying environmental information*

[64] BSI Flex 3030:2024 v2 Net Zero Transition Plans for SMEs - Code of Practice

[65] ISO 50001, *Energy management systems — Requirements with guidance for use*

[66] KRABBE, O. et al. Aligning corporate greenhouse-gas emissions targets with climate goals. Nature Climate Change, 5, 1057–1060, 2015. DOI: 10.1038. Available from: https://doi.org/10.1038/nclimate2770

[67] REKKER, S. et al. Measuring corporate Paris Compliance using a strict science-based approach. Nature Communications, 13, 4441, 2022. DOI: 10.1038/s41467-022-31143-4. Available from: https://www.nature.com/articles/s41467-022-31143-4

[68] European Commission, Joint Research Centre (JRC). Emissions Database for Global Atmospheric Research (EDGAR). Online. Luxembourg: Publications Office of the European Union, 2024. Available from: https://edgar.jrc.ec.europa.eu/

[69] Net Zero Tracker. Net Zero Tracker. Online. London: Energy & Climate Intelligence Unit; Data-Driven EnviroLab; NewClimate Institute; Oxford Net Zero, [s. a.]. Available from: https://zerotracker.net

[70] International Institute for Applied Systems Analysis (IIASA). AR6 Scenario Explorer and Database. Online. Laxenburg: IIASA, [s. a.]. Available from: https://data.ene.iiasa.ac.at/ar6

[71] Climate and Clean Air Coalition. National Methane Action Plans. Online. [s. l.]: [s. n.], [s. a.]. Available from: https://www.ccacoalition.org/resources/national-methane-action-plans