Recommendation

ITU-T L.1471 (08/2023)

SERIES L: Environment and ICTs, climate change, e-waste, energy efficiency; construction, installation and protection of cables and other elements of outside plant

Assessment methodologies of ICTs and CO_2 trajectories

Guidance and criteria for information and communication technology organizations on setting Net Zero targets and strategies

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Environment and ICTs, climate change, e-waste, energy efficiency; construction, installation and protection of cables and other elements of outside plant

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Recommendation ITU-T L.1471

Guidance and criteria for information and communication technology organizations on setting Net Zero targets and strategies

Summary

Currently, the definitions of Net Zero and related concepts such as carbon neutrality and climate neutrality for organizations remain under development. Several initiatives, including, inter alia, the Science Based Target Initiative, the United Nations Framework Convention on Climate Change (UNFCCC) Race to Zero, the UN High-level Expert Group on Credibility and Accountability of Net-Zero Emissions Commitments of Non-State Entities (HLEG), ISO IWA42, ISO TC 207, and the Net Zero Initiative are working on defining or aligning the different views of these concepts to avoid confusion and reduce risks for green washing.

Recommendation ITU-T L.1471 seeks to guide information and communication technology (ICT) organizations in clarifying the meaning of Net Zero in the context of the ICT sector and setting Net Zero targets and strategies. It also identifies actions that would lead the sector towards Net Zero according to the trajectories described in Recommendation ITU-T L.1470.

History*

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FOREWORD

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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Guidance and criteria for information and communication technology organizations on setting Net Zero targets and strategies

1 Scope

This Recommendation provides guidance and criteria to information and communication technology (ICT) organizations on setting Net Zero targets and strategies based on approaches put forward by major Net Zero initiatives. It also describes actions that should be undertaken in moving the sector towards Net Zero.

In particular, this Recommendation provides guidance to achieve the decarbonisation of the sector in line with the trajectory outlined in [ITU-T L.1470] that is a prerequisite for the subsequent steps towards Net Zero.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T L.1400]	Recommendation ITU-T L.1400 (2023), *Overview and general principles of methodologies for assessing the environmental impact of information and communication technologies.*
[ITU-T L.1410]	Recommendation ITU-T L.1410 (2014), *Methodology for environmental life cycle assessments of information and communication technology goods, networks and services.*
[ITU-T L.1420]	Recommendation ITU-T L.1420 (2012), *Methodology for energy consumption and greenhouse gas emissions impact assessment of information and communication technologies in organizations.*
[ITU-T L.1430]	Recommendation ITU-T L.1430 (2013), *Methodology for assessment of the environmental impact of information and communication technology greenhouse gas and energy projects.*
[ITU-T L.1451]	Recommendation ITU-T L.1451 (2019), *Methodology for assessing the aggregated positive sector-level impacts of ICT in other sectors.*
[ITU-T L.1470]	Recommendation ITU-T L.1470 (2020), *Greenhouse gas emissions trajectories for the information and communication technology sector compatible with the UNFCCC Paris Agreement.*
[ITU-T L.1480]	Recommendation ITU-T L.1480 (2022), *Enabling the Net Zero transition: Assessing how the use of information and communication technology solutions impact greenhouse gas emissions of other sectors.*

3   Definitions

3.1   Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1   like-for-like [b-RtZ Lexicon]: When a source of emissions and an emissions sink correspond in terms of their warming impact, and in terms of the timescale and durability of carbon storage. For example, fossil carbon is stable in the lithosphere over millennia if it is not extracted and burned, therefore mitigating measures (e.g., offsets) that aim to neutralize the effect of these emissions must persist for a comparable, geological-timescale. Although all CO_2 once emitted, whether originally sourced from the lithosphere or biosphere, persists in the active carbon cycle for centuries to millennia, it may be appropriate to balance shorter-duration carbon released from biogenic carbon stocks (e.g., forests and soils) with comparably temporary storage in like stocks. The variable risks of reversal of different carbon stocks must also be considered, for example forests may suffer from unforeseen anthropogenic (e.g., illegal logging), non-anthropogenic (e.g., disease and disaster), or climate change-induced (e.g., warming) reversal risks.

3.1.2   Net Zero (planetary level) [b-IPCC 1.5]: The International Panel on Climate Change (IPCC) defines Net Zero as that point when "anthropogenic emissions of greenhouse gases to the atmosphere are balanced by anthropogenic removals over a specified period".

NOTE – Agreement sets out the need to achieve this balance by the second half of this century and this term is defined at global planetary level.

3.1.3   removals [b-IPCC 1.5]: Anthropogenic removals refer to the withdrawal of greenhouse gases (GHGs) from the atmosphere as a result of deliberate human activities.

3.1.4   residual emission [b-ISO NZ]: Greenhouse gas emission that remains after taking all possible actions to implement emissions reductions.

NOTE 1 − Residual emissions are estimated for each year from the Net Zero target date (e.g., 2050), not for interim target dates, using a 1.5°C aligned science-based pathway.

NOTE 2 − All possible actions refer to what is technically and scientifically feasible.

3.1.5   scope 1 emission [ITU-T L.1400]: Direct GHG emission greenhouse gas emission from sources owned or directly controlled by the organization.

NOTE – Based on GHG Protocol Corporate Accounting and Reporting Standard and ISO IWA42 Net Zero Guidelines.

3.1.6   scope 2 emission [ITU-T L.1400]: Indirect GHG emission due to greenhouse gas emission from the generation of purchased electricity, heat, cooling or steam consumed by the organization.

NOTE – Based on GHG Protocol Corporate Accounting and Reporting Standard and ISO IWA42 Net Zero Guidelines.

3.1.7   scope 3 emission [ITU-T L.1400]: Indirect GHG emission that is a consequence of the organization's activities but arises from sources that are not owned or directly controlled by the organization.

NOTE 1 – Scope 3 emissions include all attributable value chain GHG emissions not included in scope 1 emissions or scope 2 emissions.

NOTE 2 – In relation to the use of sold products the term "Consequence" in this definition is limited to impacts at a first order level of effects (footprint). It shall not be confused with all the second and higher order consequences of the use of those ICT sold products, as referred to in [ITU-T L.1480].

NOTE 3 – Based on GHG Protocol Corporate Accounting and Reporting Standard and ISO IWA42 Net Zero Guidelines.

3.2   Terms defined in this Recommendation

This Recommendation defines the following term:

3.2.1   Net Zero (organization level): State reached by an organization that has reduced its value chain emissions (scope 1, scope 2 and scope 3 emissions) following science-based pathways, with any remaining residual greenhouse gas (GHG) emissions attributable to that organization being fully counterbalanced by like-for-like removals (e.g., permanent removals for fossil carbon emissions) exclusively claimed by that organization.

NOTE 1 – The term "residual" refers to residual emissions that remain technically and scientifically unfeasible to be eliminated. For the ICT sector, such residual emissions shall align with or outperform the level of residual emissions in line with the 10% referred to by [b-SBTi Net Zero II]. This level may be subject to change in the future as stricter requirements on residual emissions could be expected to develop.

NOTE 2 – Definition based on [b-RtZ Criteria] and [b-SBTi Net Zero II].

4   Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

A/R	Afforestation/Reforestation
BECCS	Bio-Energy Carbon Capture and Storage
CCS	Carbon Capture and Storage
CDP	Carbon Disclosure Project
CDR	Carbon Dioxide Removal
CER	Certified Emission Reduction
GHG	Greenhouse Gas
GHG Protocol	Greenhouse Gas Protocol
ICT	Information and Communication Technology
IPCC	International Panel on Climate Change
NZI	Net Zero Initiative
SBTi	Science-based Targets Initiative
SDA	Sectoral Decarbonization Approach
SDG	Sustainable Development Goal
UNFCCC	United Nations Framework Convention on Climate Change
VCM	Voluntary Carbon Market
WRI	World Resources Institute

5   Conventions

In this Recommendation, the term "removal" is used instead of the equivalent term "sequestration".

Moreover, "counterbalancing" is used in the main text. The term "neutralization" is used instead of "counterbalancing" by some initiatives. That term is used in some informative appendixes reflecting those initiatives.

6   Background information

The International Panel on Climate Change (IPCC) defines Net Zero at a global planetary level as that point when "*anthropogenic emissions of greenhouse gases to the atmosphere are balanced by anthropogenic removals over a specified period*".

The Paris Agreement states the need to achieve this balance by the second half of this century. Furthermore, in October 2018, the IPCC confirmed that, in order to limit global warming to 1.5°C, the world needs to halve CO_2 emissions by around 2030 compared to 2015 levels and reaches Net Zero CO_2 emissions by mid-century. The more recent 6th assessment report further stresses the consequences of climate change and the need to reduce emissions quickly to avoid the most severe consequences.

The current emissions situation can be described with the bathtub metaphor summarized in Figure 1 and developed by the Net Zero Initiative [b-NZI Framework]. It illustrates how in order to stabilize the water level in the bathtub at a reasonable level and thus meet the temperature objectives of 2°C or 1.5°C, the incoming carbon flows must correspond to the annual outgoing flows.
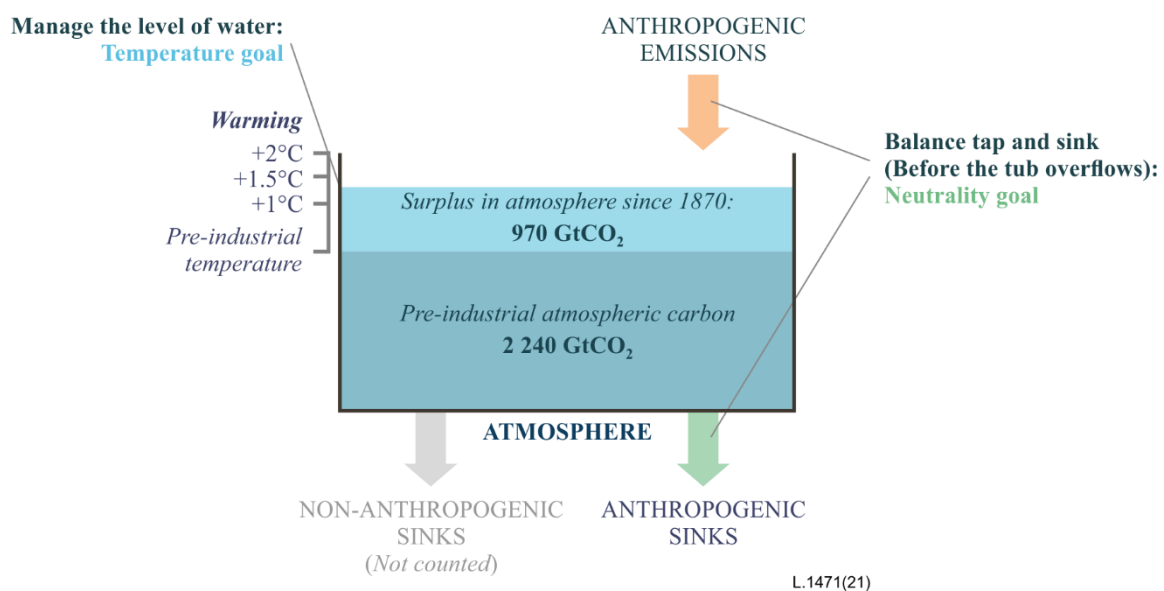

Figure 1 – The bathtub metaphor related to Net Zero targeting at planetary level
source: [b-NZI Framework]

Following this, the ITU-T Recommendation [ITU-T L.1470] on greenhouse gas emissions trajectories for the information and communication technology sector compatible with the United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement, was created.

However, [ITU-T L.1470] also outlines the long-term perspectives in relation to its two normative scenarios, making reference to the ambition of reaching Net Zero in the frame of ICT organizations.

[ITU-T L.1470] states:

"*In the longer term, the IPCC P2 trajectory shows a GHG emissions reduction of about 88% in 2050. Remaining emissions should be net zeroed by 2050 with carbon dioxide removals (CDRs), e.g., carbon sinks, BECCS and direct air capture*". (clause 9.1)

"*It should be noted that offsets cannot be considered in meeting an SBT initiative-approved target. However, a long-term target for the ICT sector would be to achieve net zero emissions by 2050. This is consistent with SBT initiative requirements and is aligned with a 1.5°C trajectory, while also recognizing the high level of electricity usage by the sector*". (clause 9.2)

Several organizations, including, inter alia, the Science Based Target Initiative, the UNFCCC Race to Zero initiative, the UN High-level Expert Group on Credibility and Accountability of Net-Zero Emissions Commitments of Non-State Entities (HLEG), ISO IWA42, and the Net Zero Initiative have developed guidance on Net Zero approaches to avoid confusion and reduce risks of green washing.

At the same time, the UNFCCC Climate Neutral Now initiative and ISO TC 207 are addressing the related, but different, concepts of climate neutrality and carbon neutrality. Currently those concepts are often associated with the idea of "compensation" outside the value chain (known as "offsetting") of any given amount of remaining emissions, while Net Zero strategies focus on emission reductions within the value chain as the main strategy towards its achievement. Compensation strategies are currently debated and several stakeholders, among them the French public agency Ademe [b-Ademe], has taken measures to restrict carbon neutrality claims at an organizational level.

To date, several main documents are available providing guiding principles for organizations to set Net Zero targets:

•   *Integrity matters: Net Zero commitments by businesses, financial institutions, cities and regions* released 2022 by the UN High-level Expert Group on Credibility and Accountability of Net-Zero Emissions Commitments of Non-State Entities (HLEG) [b-UN HLEG].

•   *Net Zero Guidelines* released 2022 by ISO IWA 42 [b-ISO NZ].

•   *Starting Line and Leadership practices 3.0* – In force from 15 June 2022 for new applicants and from 15 June 2023 for existing partners and their members, released 2022 by the UNFCCC Race to Zero initiative [b-RtZ criteria].

•   SBTi Corporate Net-zero Standard Version 1.1 April 2023 [b-SBTi Net Zero II].

•   *Net Zero Initiative, a framework for collective carbon neutrality*, released by the Net Zero Initiative and Carbone 4 in April 2020 [b-NZI framework].

Building on these, the following clauses provide guidance for ICT sector organizations to set net zero targets and strategies that contribute to reaching net zero at planetary level at the pace necessary to comply with the provisions of the Paris Agreement, limiting global warming mean at +1.5°C in 2100 compared to pre-industrial levels.

NOTE – ICT companies wanting to claim conformity to other standards would need to consult them and cannot refer solely to this guidance.

After presenting existing Net Zero initiatives and the main criteria to be followed by an ICT sector organization setting a Net Zero target, guidance is provided regarding reduction of GHG emissions, removal of GHG emissions and avoidance of GHG emissions.

7   Net Zero definition and approaches

The Net Zero concept emerges from IPCC and was originally established as a term at the planetary level. Used in this sense, IPCC defines Net Zero as the point when "anthropogenic emissions of greenhouse gases to the atmosphere are balanced by anthropogenic removals over a specified period".

Further details regarding IPCC definitions are found in Appendix I.

Building on IPCC and seeking to guide companies on how they should contribute to Net Zero several initiatives have been developed.

These initiatives are summarized in appendices II to V and include:

•   ISO IWA42

- HLEG
- UNFCCC Race to Zero
- SBTi Net Zero
- Net Zero Initiative
- UNFCCC Climate Neutral Now.

Based on these initiatives, clause 8 defines criteria for ICT organizations setting Net Zero targets and strategies.

8 Criteria to be followed by an ICT sector organization setting a Net Zero target and strategies

Taking into account the existing frameworks to date and referring to the Net Zero definition put forward in this Recommendation (see clause 3.2.1), ICT organizations' Net Zero targets and pathways shall follow the following principles/criteria:

General criteria

- Organizations shall reach Net Zero GHG emissions by no later than 2050, 2040 is recommended. While earlier target years are encouraged, a more ambitious timeframe should not come at the expense of the level of reduction of own value chain emissions in the target.
- Net Zero shall be seen as a future state with remaining emissions being only those being technically unfeasible to eliminate.
- The main vehicle towards Net Zero shall be reduction of scope 1, 2 and 3 emissions and emission reduction efforts shall be the priority.
- All Net Zero strategies shall adhere to robust social and environmental principles, ensuring amongst others, protection and/or restoration of naturally occurring ecosystems, robust social safeguards, and protection of biodiversity, amongst others. See also "Wider action" below.

Reduction of value chain emissions

- The full value chain including scope 1, scope 2 and scope 3 emissions shall be considered in accordance with the boundaries defined in [ITU-T L.1420] while considering both location- and market-based approaches for calculating emissions associated with scope 2.
- All GHG emissions shall be included in the Net Zero target.
- Organizations' pathways towards the state of Net Zero shall follow a science-based pathway aiming towards or beyond a fair share of halving of global emissions by 2030 compared to 2015 levels and must reflect this in an interim target. Thus, ICT sector organizations shall reduce scope 1, 2 and 3 emissions in line with or over-performing the trajectories outlined in [ITU-T L.1470] and [b-ITU-T L-Sup.37] for operators (also available in [b-SBTi ICT]) and [b-ITU-T L-Sup.38] for manufacturers and potential other Supplements to come which are all representative of such a pathway. Organizations shall also make sure that the less prescriptive scope 3 emission reduction efforts described in the above-mentioned documents, are ambitious enough to stay within this trajectory. This way, organizations maintain consistency with mitigation pathways that limit warming to 1.5°C with zero or limited overshoot.
- Consequently, organizations shall set intermediate GHG emissions reduction objectives for 2030 respecting or over-performing the trajectories defined in [ITU-T L.1470] and its associated guidance Supplements, namely [b-ITU-T L-Sup.37] for operators,

[b-ITU-T L-Sup.38] for manufacturers and, potentially other Supplements to come while covering scope 1, 2 and 3 emissions.

- The organization should consider setting and promoting additional more ambitious targets.

To comply with [b-UN HLEG], Net Zero pledges should include specific targets aimed at ending the use of and/or support for fossil fuels in line with IPCC and IEA net zero greenhouse gas emissions modelled pathways that limit warming to 1.5°C with no or limited overshoot, with global emissions declining by at least 50% by 2030, reaching Net Zero by 2050. Specifically [b-UN HLEG] states that the transition away from fossil fuels must be matched by a fully funded transition toward renewable energy. The organization should aim to use 100% low carbon renewable energy. Also, [b-RtZ Criteria] stresses to the importance of phasing down and out fossil fuels.

Removals

- At the time that Net Zero is reached, GHG emissions that are not feasible for an ICT organization to abate shall be counterbalanced by GHG removals.

- Organizations shall plan and prepare to implement yearly GHG removals, from the target year of Net Zero at the latest and at least at the level of the remaining emissions while following a like-for-like principle.

- Any removal to balance emissions shall follow like-for-like principles and be permanent when Net Zero is claimed and be uniquely claimed by the organization.

- During an organization transition to Net Zero, removal measures and offsetting through purchase of carbon credits (known as "compensation") may complement, but not substitute, reducing value chain emissions in line with science. Such measures cannot be used to claim a Net Zero state but shall be seen as a way to further support the global transition to Net Zero.

- Any removals associated with the ICT organizations Net Zero strategy, including those undertaken to counterbalance residual emissions at Net Zero, as well as any additional offsetting shall: (a) ensure additionality, (b) have measures to assure permanence of the mitigation outcomes, (c) address leakage and (d) avoid double-counting between organizations.

NOTE – [b-ISO NZ] and the forthcoming ISO 14068 define further rules for offsetting.

For ICT organizations intending to comply with [b-ISO NZ], the organization should also consider assessing historical GHG emissions (pre-baseline GHG emissions accumulated over a specified period of time). When counterbalancing historical emissions, organizations should follow the same guidance detailed by [b-ISO NZ] as when counterbalancing residual emissions. Any information on counterbalancing of historical emissions should be treated separately and should be additional to actions to address GHG emissions to meet interim and Net Zero targets.

NOTE – The concept of historical emissions is not yet well defined, and such emissions could be difficult to derive due to company dynamics and age.

Avoidance

- In addition to their Net Zero emission reduction and removal approaches, ICT organizations should also help society to reach a Net Zero state by developing GHG emissions avoidance, in particular through the provision of ICT networks, goods and services, assessing and documenting the benefits brought by these ICT networks, goods and services, according to the principles indicated in [ITU-T L.1480], [ITU-T L.1430] and [ITU-T L.1451].

- During the transition of an organization to Net Zero, avoidance measures may complement, but not substitute, reducing value chain emissions in line with science. Such measures cannot be used to claim a Net Zero state but shall be seen as a way to further support the global transition to Net Zero.

Transition plans

- The organization shall publicly disclose comprehensive and actionable Net Zero transition plans which indicate actions that will be undertaken to meet all targets, as well as align governance and incentive structures, capital expenditures, research and development, skills and human resource development, and public advocacy, while also supporting a just transition. Transition plans should be updated every two to five years and progress should be reported annually. Due to the dynamics of the ICT sector, the shorter time interval is expected to be more relevant. [b-UN HLEG] states that transition plans should include what actions will be taken within the next 12 months, within 2 to 3 years, and by 2030.

Disclosure

- Organizations shall describe how the organization intends to achieve the Net Zero target.

- Organizations shall be transparent about the sources of emissions included and excluded from the target boundary, the timeframe for achieving Net Zero emissions, the amount of emission reduction and removals planned in reaching Net Zero emissions, and their interim targets or milestones.

- Any use of sinks and credits shall be clearly stated and cannot be used to claim a Net Zero state until only a residual fraction of emissions remain.

- Organizations shall transparently report measures taken and progress made towards reaching the Net Zero status, reporting separately emission reductions, removals and avoidance on an annual basis.

- Any deviations shall be explained, motivated and documented.

- Organizations shall report in a standardised, open format and, to comply with [b-UN HLEG], and also report via public platforms that feed into the UNFCCC Global Climate Action Portal to address data gaps, inconsistencies and inaccessibility that slow climate action.

- Non-state actors shall have their reported emissions reductions verified by independent third parties. Special attention will be needed to build sufficient capacity in developing countries to verify emission reductions.

Wider action

- Targets should take into account needs for inclusivity, fair share and just transition to global Net Zero.

- Actions should safeguard society, human settlements, communities and core human needs.

- The organization should consider how its Net Zero strategy aligns with the United Nations sustainable development goals (SDGs) and how it impacts:
  – climate justice and equity;
  – its workforce;
  – indigenous peoples, local communities and minority and vulnerable groups (e.g., women, children, elderly people, people with disabilities);
  – society and cultures;
  – prosperity and eliminating poverty;
  – biodiversity, the integrity of ecosystems and related critical services (e.g., food, water).

In addition to the above requirements, ICT organizations intending to comply with [b-UN HLEG] shall align their external policy and engagement efforts, including membership in trade associations, to the goal of reducing global emissions by at least 50% by 2030 and reaching Net Zero by 2050. This means lobbying for positive climate action and not lobbying against it.

At the time of elaboration of this Recommendation, these criteria are considered as being consistent with the guidelines elaborated by SBTi, the Race to Zero, the UN High-level Expert Group on Credibility and Accountability of Net-Zero Emissions Commitments of Non-State Entities (HLEG), ISO IWA42, Climate Neutral Now programmes from the UNFCCC and the Net Zero Initiative. However to make sure of fully complying to either of these, organizations are recommended to refer to them for detailed alignment.

9 Reduction of GHG emissions

Reduction of emissions is the main strategy towards Net Zero for all sectors, including the ICT sector. In line with clause 8, ICT sector organizations setting Net Zero targets need to respect or over-perform the trajectories defined in [ITU-T L.1470].

Consequently, ICT organizations shall give priority to GHG emissions reductions respecting or over-performing the trajectories defined in [ITU-T L.1470] and its associated guidance Supplements, namely [b-ITU-T L-Sup.37] for operators, [b-ITU-T L-Sup.38] for manufacturers and, potentially other Supplements to come.

In line with [ITU-T L.1470], acknowledging that the majority of the ICT sector emissions are associated with the use of energy, the main strategy to decarbonize the ICT sector, at the pace necessary to align with 1.5°C trajectories, is the implementation of simultaneous, vigorous and urgent actions in the following fields:

•   implementation of energy efficiency plans;

•   switch to renewable or low carbon electricity supplies;

•   encouragement of carbon consciousness among end-users.

Figure 2 shows some examples of categories of supporting actions.

CATEGORIES:

● **OPERATING ENERGY-EFFICIENT NETWORK**
1. Multiple power saving features
2. Alternative energy supply
3. Consolidation and virtualization
4. Free cooling and location optimization

● **ALTERNATIVE ENERGY**
9. Self-production of renewable energies
10. Purchasing renewable energy the certificate of origin and PPA
11. Energy supply innovation

● **EFFICIENCY IN BUILDINGS AND SERVICES**
5. Monitoring solutions for efficient buildings
6. Focus on energy conservation measures
7. Alternative mobility concepts
8. Videoconferencing and audioconferencing

● **APPLICATION OF THE CIRCULAR ECONOMY PRINCIPLES**
12. Eco-design of products and services
13. Reuse of network equipment
14. Optimizing the life cycle and end-of-life of customer products and services
15. Selling repairable products

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Figure 2 – Decarbonization measures
(source: [ITU-T L.1470])

ICT organizations should also refer to the most recent [b-UNFCCC Pathways] in particular the industry pathway [b-UNFCCC Industry] for applicable measures.

10 Removals of GHG emissions

While the main strategy for achieving Net Zero is associated with actual reduction of emissions, the residual emissions which cannot be reduced, need to be balanced with like-for-like or permanent removals which respect an additionality principle, i.e., the removals cannot be part of another organization's reduction but can be additional to other measures already accounted for in the carbon budgets.

As stated in clause 8, when setting Net Zero targets, ICT organizations shall plan to implement yearly GHG removals, from the date of the Net Zero status, at least at the level of the residual emissions following a like-for-like principle.

Following the current SBTi guidance on Net Zero, the intended amount of GHG emissions to be removed shall be captured and stored before the equivalent amount is released into the atmosphere.

Whenever possible, removal of carbon emissions for the longest possible periods shall be preferred, such as reforestation, mangroves, plantations for long-living bio-materials such as furniture or harvested wood products, for building purposes for instance, or when adequate technologies will be available, geological removals.

Generally, GHG removal shall be implemented according to the acknowledged and most restrictive frameworks related to assessments and implementation.

NOTE 1 – GHG protocol is currently developing a new greenhouse gas protocol guidance on accounting for land sector activities and CO_2 removals in corporate greenhouse gas inventories. Other organizations also provide guidance in this area such as the Gold Standard and Verra.

In addition, risks of reversal in carbon removal, for instance due to fire, drought and pests, shall be identified and actively managed and fought over the period of removal. The actions undertaken shall be documented.

In all cases, the like-for-like principle shall be followed for removals.

NOTE 2 – ICT services could improve removal efforts.

11   Avoidance of GHG emissions

In addition to their Net Zero emission reduction and removal approaches, ICT organizations should also help society to reach a Net Zero state by developing GHG emissions avoidance, in particular through the provision of ICT networks, goods and services, and assess and document the benefits brought by these ICT networks, goods and services, according to the principles indicated in [ITU-T L.1480], [ITU-T L.1430], and [ITU-T L.1451] and other relevant ITU-T Recommendations to come.

Thus, beyond working on their transition to a Net Zero state ICT organizations should also support other sectors in their transformation. One important source which outlines the pathways for such transformation is the UNFCCC pathways [b-UNFCCC Pathways] across sectors. For the current decade the exponential roadmap [b-Exp Roadmap] could provide high level guidance on how ICT organizations can support a 1.5°C aligned pathway.

As indicated above, when setting Net Zero targets, ICT organizations shall develop GHG emissions avoidance, in particular through the provision of ICT goods and services, and assess the benefits brought by these ICT goods and services.

[ITU-T L.1430] provides a list of ICT goods and services potentially facilitating GHG emissions avoidance in other sectors.

1)   Smart buildings

2)   Smart logistics and transport

3)   Smart grids

4)   Smart motors and manufacturing

5)   Dematerialization, including teleworking, virtual conferencing, e-media, e-documents

6)   Carbon management software.

Figure 3 gives some examples of how different digital technologies could support other sectors.

Key digital technologies	What does it mean	How they help can help limit global warming 1.5°C	How they risk accelerating global warming towards 4°C
Social media	Interactive technologies that facilitate the creation and sharing of information via networks while collecting personal data for behavioural insights	Support democracy. Promote fact-based worldviews. tackle misinformation. Utilize behavioural insights to enable sustainable lifestyles. Enable global climate movements. Help displace the need for physical travel.	Spread misinformation e.g., climate denial. Undermine democratic processes. Encourage unsustainable consumption.
E-commerce	Buying or selling of products and services over the Internet	Support a shift to sustainable, low-carbon products and services through information and nudging.	Simplify high-carbon consumption through low prices, fast delivery and heavy promotion, leading to increased waste of material, energy and transportation.
Internet of things	Connecting devices and everyday objects to each other and online services	Optimise any type of system to save energy, materials and to enable a circular economy. Enable distributed demand response to help balance electricity grids.	Increase efficiency of oil and gas extraction and production of high-carbon products thereby delaying the shift to low-carbon alternatives.
AI, machine and deep learning	The ability of a machine or computer programme to think and learn.	Continuous improvement of energy systems, factories, buildings and vehicles. Drive down costs and carbon footprint, while improving performance and functionality. Linking with social media and other technologies, it can also help people to understand their footprint and nudge them in a sustainable direction.	Accelerate high-carbon consumption, long-distance travel and goods transportation through biased algorithms and profiled online advertising.
5G mobile networks	5th generation cellular network technology providing higher speed connectivity to people, enterprises and objects.	Mass scale, global connection of electric grids, buildings, industries, cities, vehicles and things combined with AI and machine learning enable efficiency of systems. Virtual meetings and virtual and augmented reality reduces need for travelling. Resource-efficient manufacturing flows and autonomous services brings down use of resources.	Enable acceleration of high-carbon intense industries and digital platforms, which drives high-carbon consumption.
Blockchain	An open distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way	Allows greater transparency throughout the value chain of goods and services, making it easier to drive decarbonization. Enable distributed coordination of physical energy flows and financial flows.	Current cryptocurrencies using blockchain technologies have a high energy demand - currently equivalent to a small developed country.
Digital twin	A digital replica of a living or non-living physical system	Allows designers and engineers to test and simulate how systems such as cities and grids can be improved, optimized and transformed.	Can be deployed to accelerate fossil-based high-carbon systems.

* These lists are not mutually exclusive

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Figure 3 – Example of how digital technologies could be used to support the transition to Net Zero (source: [b-Exp Roadmap])

Emissions avoided shall be calculated in accordance with [ITU-T L.1480]. [ITU-T L.1451] provides further useful reference on the benefits brought by ICT services in terms of reduced GHG emissions in other sectors of the economy.

Organizations referring to the avoidance they have enabled shall also be transparent regarding any services contributing to decelerating the transition to the Net Zero society.

At this stage, the target-setting corresponding to the avoided emissions for products and services is recommended to be "as large as possible". This is in line with the option 1 of the guidance from the Net Zero Initiative.

In addition, ICT organizations can optionally contribute to GHG emissions avoidance by financing certified or validated emission reduction projects outside of their value chain, through the purchase of carbon credits or green bonds. As indicated in the Net Zero Initiative guidance, in the cases where a project has not been certified by a standard, it shall be calculated and validated by a third party according to a recognized methodology.

In any case, such financial measures are seen as additional to the measures undertaken to reach Net Zero and shall be stated separately from scope 1, 2 and 3 emission levels and emission reduction measures. Such financial measures shall not be used by an ICT organization to claim to be Net Zero.

Appendix I

IPCC

(This appendix does not form an integral part of this Recommendation.)

The Net Zero concept emerged from IPCC and was originally established as a term at the planetary level. Used in this sense, IPCC defines Net Zero as the point when "anthropogenic emissions of greenhouse gases to the atmosphere are balanced by anthropogenic removals over a specified period".

NOTE – The Paris Agreement [b-UNFCCC PA] sets out the need to achieve this balance by the second half of this century and this term is defined at global planet Earth level.

IPCC further gives the following definitions at the planetary level [b-IPCC Glossary]:

Carbon neutrality: Net Zero carbon dioxide (CO_2) emissions are achieved when anthropogenic CO_2 emissions are balanced globally by anthropogenic CO_2 removals over a specified period. Net Zero CO_2 emissions are also referred to as carbon neutrality. See also Net Zero emissions and net negative emissions.

Net Zero emissions: Net Zero emissions are achieved when anthropogenic emissions of greenhouse gases to the atmosphere are balanced by anthropogenic removals over a specified period. Where multiple greenhouse gases are involved, the quantification of Net Zero emissions depends on the climate metric chosen to compare emissions of different gases (such as global warming potential, global temperature change potential, and others, as well as the chosen time horizon). See also Net Zero CO_2 emissions, negative emissions and net negative emissions.

Climate neutrality: Concept of a state in which human activities result in no net effect on the climate system. Achieving such a state would require balancing of residual emissions with emission (carbon dioxide) removal as well as accounting for regional or local biogeophysical effects of human activities that, for example, affect surface albedo or local climate. See also Net Zero CO_2 emissions.

Appendix II

UN High-level Expert Group on Credibility and Accountability of Net-Zero Emissions Commitments of Non-State Entities (HLEG)

(This appendix does not form an integral part of this Recommendation.)

The UN High-level Expert Group on Credibility and Accountability of Net-Zero Emissions Commitments of Non-State Entities (HLEG) was established by the UN Secretary General in March 2022 to develop stronger and clearer standards for Net Zero emissions pledges by non-State entities – including businesses, investors, cities, and regions – and speed up their implementation.

With their report *"Integrity matters: Net Zero commitments by businesses, financial institutions, cities and regions"* [b-UN HLEG], the Expert Group provides a roadmap to prevent Net Zero from being undermined by false claims, ambiguity and "greenwash". The report builds on the existing science and best-in-class voluntary efforts to create a universal definition of Net Zero, based on five principles and ten recommendations to guide the future of Net Zero, and focused on the actions that need to be taken by cities, states, corporations and those who regulate them. Due to the risks associated with greenwashing, the HLEG sees regulative measures as necessary.

The five principles outlined in their report include:

1   Ambition which delivers significant near and medium term emissions reductions on a path to global Net Zero by 2050;

2   Demonstrated integrity by aligning commitments with actions and investments;

3   Radical transparency in sharing relevant, non-competitive, comparable data on plans and progress;

4   Established credibility through plans based in science and third-party accountability;

5   Demonstrable commitment to both equity and justice in all actions.

According to the HLEG, a Net Zero pledge must be a commitment by the entire entity for the entire value chain, made in public by the leadership, and be reflective of a fair share of the needed global climate mitigation. It must also contain stepping stone targets for every five years, and set out concrete ways to reach Net Zero in line with the Intergovernmental Panel on Climate Change (IPCC) or International Energy Agency (IEA) Net Zero greenhouse gas (GHG) emissions modelled pathways that limit warming to 1.5°C with no or limited overshoot. Moreover, urgency is as global emissions must decline by at least 50% by 2030. Deep emission reductions are seen as priority and use of carbon credits considered as additional to keep in line with the entity's own net zero pathway.

Transparency on plans, governance and annual progress in independently reviewed reports is demanded, and entities must align incentive structures and public advocacy as well as support a just transition. Specifically reports should be added to the UNFCCC Global Climate Action Portal. In particular, businesses must not support new supply of fossil fuels and must lobby for positive climate action. Working on standards is seen as important to help create an ambition loop and ensure a level playing field for ambitious Net Zero pledges and to further de-risk a speedy transition and maximise the economic benefits of rigorous Net Zero alignment.

The HLEG also urge countries to launch a new Task Force on Net Zero regulation to convene regulators across borders and across regulatory domains, alongside leading voluntary and standard-setting initiatives and independent experts, to drive reconfiguration of the ground rules of the global economy to align to the goals of the Paris Agreement.

Main recommendations

The HLEG report outlines ten main recommendations which are accompanied by detailed recommendations (see [b-UN HLEG]).

1   Announcing a Net Zero pledge

A Net Zero pledge should be made publicly by the leadership of the non-state actor and represent a fair share of the needed global climate mitigation effort. The pledge should contain interim targets (including targets for 2025, 2030 and 2035) and plans to reach Net Zero in line with IPCC or IEA Net Zero greenhouse gas emissions modelled pathways that limit warming to 1.5°C with no or limited overshoot, and with global emissions declining by at least 50% by 2030, reaching Net Zero by 2050 or sooner. Net Zero must be sustained thereafter.

2   Setting Net Zero targets

Non-state actors must have short-, medium- and long-term absolute emissions reduction targets and, where appropriate, relative emissions reduction targets across their value chain that are at least consistent with the latest IPCC Net Zero greenhouse gas emissions modelled pathways that limit warming to 1.5°C with no or limited overshoot, and where global emissions decline at least 50% below 2020 levels by 2030, reaching Net Zero by 2050 or sooner.

3   Using voluntary credits

Non-state actors must prioritise urgent and deep reduction of emissions across their value chain. High integrity carbon credits in voluntary markets should be used for beyond value chain mitigation but cannot be counted toward a non-state actor's interim emissions reductions required by its Net Zero pathway.

High-integrity carbon credits are one mechanism to facilitate much-needed financial support towards decarbonizing developing country economies. As best-practice guidelines develop, non-state actors meeting their interim targets on their Net Zero pathway are strongly encouraged to balance out the rest of their annual unabated emissions by purchasing high-integrity carbon credits.

A high-quality carbon credit should, at a minimum, fit the criteria of additionality (i.e., the mitigation activity would not have happened without the incentive created by the carbon credit revenues) and permanence.

4   Creating a transition plan

Non-state actors must publicly disclose comprehensive and actionable Net Zero transition plans which indicate actions that will be undertaken to meet all targets, as well as align governance and incentive structures, capital expenditures, research and development, skills and human resource development, and public advocacy, while also supporting a just transition. Transition plans should be updated every five years and progress should be reported annually.

5   Phasing out of fossil fuels and scaling up renewable energy

All Net Zero pledges should include specific targets aimed at ending the use of and/or support for fossil fuels in line with IPCC and IEA Net Zero greenhouse gas emissions modelled pathways that limit warming to 1.5°C with no or limited overshoot, with global emissions declining by at least 50% by 2030, reaching Net Zero by 2050.

The transition away from fossil fuels must be just for affected communities, workers and all consumers to ensure access to energy, and avoid transference of fossil fuel assets to new owners. The transition away from fossil fuels must be matched by a fully funded transition toward renewable energy.

6 Aligning lobbying and advocacy

Non-state actors must align their external policy and engagement efforts, including membership in trade associations, to the goal of reducing global emissions by at least 50% by 2030 and reaching Net Zero by 2050. This means lobbying for positive climate action and not lobbying against it.

7 People and nature in the just transition

As part of their Net Zero plans, businesses, cities and regions with material land-use emissions must achieve and maintain operations and supply chains that avoid the conversion of remaining natural ecosystems eliminating deforestation and peatland loss by 2025 at the latest, and the conversion of other remaining natural ecosystems by 2030.

Financial institutions should have a policy of not investing or financing businesses linked to deforestation and should eliminate agricultural commodity-driven deforestation from their investment and credit portfolios by 2025, as part of their Net Zero plans.

8 Increasing transparency and accountability

Non-state actors must annually disclose their greenhouse gas data, net zero targets and the plans for, and progress towards, meeting those targets, and other relevant information against their baseline along with comparable data to enable effective tracking of progress toward their Net Zero targets.

Non-state actors must report in a standardised, open format and via public platforms that feed into the UNFCCC global climate action portal to address data gaps, inconsistencies and inaccessibility that slow climate action.

Non-state actors must have their reported emissions reductions verified by independent third parties. Special attention will be needed to build sufficient capacity in developing countries to verify emission reductions.

Disclosures ought to be accurate and reliable. Large financial and non-financial businesses should seek independent evaluation of their annual progress reporting and disclosures, including opinion on climate governance, as well as independent evaluation of metrics and targets, internal controls evaluation and verification on their greenhouse gas emissions reporting and their emission reductions.

9 Investing in just transitions

To achieve Net Zero globally, while also ensuring a just transition and sustainable development, there needs to be a new deal for development that includes financial institutions and multinational corporations working with governments, multilateral development banks and development finance institutions to consistently take more risk and set targets to greatly scale investments in the clean energy transition in developing countries.

10 Accelerating the road to regulation

In order to ensure rigour, consistency and competitiveness, regulators should develop regulation and standards in areas including Net Zero pledges, transition plans and disclosure, starting with high-impact corporate emitters, including private and state-owned enterprises and financial institutions.

The challenge of fragmented regulatory regimes should be tackled by launching a new task force on Net Zero regulation that convenes a community of international regulators and experts to work together towards Net Zero.

Appendix III

ISO IWA42

(This appendix does not form an integral part of this Recommendation.)

Seeing the emergence of many parallel Net Zero initiatives, some of them referred to by this Recommendation, the ISO In Workshop Agreement 42 (IWA 42) was set up to seek alignment between them and to form a common reference for governance organizations (including voluntary initiatives, adoption of standards, policy and national and international regulation), and to help organizations taking action to contribute to achieving global Net Zero. Moreover, it aimed to maintain and promote the highest possible climate ambition in line with underlying climate science. This is referred to in the IWA, [b-ISO NZ], as:

"Scientific assessments through the intergovernmental panel on climate change (IPCC) reports have shown that many of the worst consequences of climate change can be avoided by limiting global warming to 1,5°C above preindustrial levels. The global temperature is already 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 carbon dioxide (CO_2) emissions in the early 2050s, along with deep and sustained global reductions in other greenhouse gas emissions (GHGs). These scenarios also show that the earlier and faster emission reductions occur, the lower peak warming and the lower the likelihood of overshooting warming limits. Peak warming depends on cumulative CO_2 emissions from the beginning of the industrial period up to the time they are reduced to Net Zero, combined with the change in non-CO_2 emissions on the climate system, by the time the temperature peaks".

Following its intention, the ISO Net Zero Guidelines [b-ISO NZ] builds on progress by voluntary initiatives, campaigns and governance, and support their purpose of progressing to a climate positive future, increasing their reach and enabling a more consistent approach for future interventions and deliverables, including ISO standards. In particular, the scope of [b-ISO NZ] is aligned to the objectives of the [b-UN HLEG], described in Appendix II.

More specifically, [b-ISO NZ] provides guiding principles and recommendations to enable a common approach with a high level of ambition, to drive organizations to achieve net zero GHGs as soon as possible and by 2050 at the latest, addressing their full value chain. In particular, it demands organizations to set interim targets as milestones towards its net zero target, taking into account the specific recommendations for scope 1, scope 2 and scope 3 and 1,5°C aligned science-based pathways.

According to [b-UNFCCC PA] achieving a global balance between human-caused emissions by sources and human-led removals by sinks in the second half of the 21st century, includes taking into account varying capabilities in different parts of the world, on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty. [b-ISO NZ] therefore includes recommendations on equity and wider impact.

Besides outlining the ambition level corresponding to Net Zero, [b-ISO NZ] provides guidelines from a Net Zero management perspective including principles, leadership and commitment, roles and responsibilities, planning, target setting, prioritization, measurement and monitoring, and communication and reporting. It also provides specific guidance on the use of credits.

Finally, it expands the focus to also consider wider impacts, equity and empowerment,

To understand the full set of recommendations and guidelines of [b-ISO NZ] readers are recommended to refer to the guidelines themselves, especially with regards to management guidance, handling of credits and wider impacts.

However, below are some items of particular interest to establish a Net Zero ambition:

A single target for organizations of Net Zero for all greenhouse gas emissions, as soon as possible or by 2050 at the latest, is used to provide a common, understandable and ambitious target, in line with scientific consensus on the global effort needed to limit warming to 1,5°C with no or limited temperature overshoot. Hence, the organization should set targets consistent with 50% global GHG emissions reductions by 2030 (from a 2018 global baseline), achieving Net Zero by 2050 at the latest, and supporting global efforts to limit global warming to 1,5°C above pre-industrial temperatures.

The organization should determine a plan of prioritized actions to be taken to achieve interim targets which support the stated long-term Net Zero target. The organization should ensure that all GHG emissions (scope 1, scope 2 and scope 3 emissions), are taken into account and included in planned actions to achieve net zero. The organization should ensure targets are set separately for scope 1, scope 2 and scope 3. The organization should set interim targets every 2 to 5 years on the path to achieving Net Zero GHG emissions. Interim targets should be based on scientific evidence and reflect maximum effort towards the full mitigation potential of the organization, consistent with a fair share of 50% global GHG emissions reduction by 2030 from a 2018 base year.

The organization should consider the negative climate impacts other than from GHG emissions, such as high-altitude effects due to vapour trails from aircraft, and determine appropriate actions to address these if relevant.

To claim Net Zero, only residual emissions should remain, and these should be counterbalanced by removals. The organization should not make a Net Zero claim if it is on the path to Net Zero and still has GHG emissions that are not residual emissions, even if the emissions are counterbalanced.

In a situation where other emissions remain, the organization should communicate progress towards specific emissions reduction targets to provide a transparent indication for the prospects of achieving Net Zero. To achieve and maintain Net Zero, the organization should counterbalance residual emissions only through investment in high-quality removals which can be in the value chain or through removal-based offsets and removal-based credits.

If the organization offsets emissions, only those counterbalancing residual emissions should count towards its Net Zero target. The organization should not use offsets towards achievement of interim targets.

In addition to Net Zero targets, the organization should set additional, separate targets to have a neutral or positive impact on nature (e.g., a biodiversity net gain target, enhanced land regeneration). The organization should apply environmental and social safeguards to ensure that Net Zero actions do not have adverse environmental and social impacts and should seek to enhance environmental and social benefits.

In addition to actions to achieve interim and Net Zero targets, the organization should consider assessing historical GHG emissions (pre-baseline GHG emissions accumulated over a specified period of time. When counterbalancing historical emissions, organizations should follow the same guidance as when counterbalancing residual emissions. The organization should treat historical GHG emissions separately and should not include actions to address these GHG emissions to meet interim and Net Zero targets.

The organization shall achieve Net Zero CO_2 at the global level and sufficient reductions in other GHG emissions by 2050, with low reliance on removals.

When setting targets the organization should calculate scope 2 emissions from energy using the average GHG emissions of the grid where the utility is based (location-based accounting) whenever possible. The organization may also calculate scope 2 emissions on the energy purchased (market-based accounting). The organization should, if possible, use both methods of calculation and should prioritize the higher of the two values for improving energy efficiency.

The organization should set targets to significantly reduce energy consumption and increase the use of low carbon technologies and production or procurement of low carbon (non-fossil) or renewable energy by 2030 (e.g., 80% reduction of energy consumption).

The organization should aim to use 100% low carbon renewable energy.

Organizations are requested to:

a)   prioritize emissions reductions within the organization's boundaries and its value chain, using applicable science-based pathways (including sector pathways) to set targets;

b)   use alternatives to high GHG emitting processes, materials, practices and services, taking into account the lifecycle of products, buildings and other assets;

c)   prioritize environmental integrity and the protection and enhancement of nature (e.g., ending deforestation, supporting afforestation, protecting biodiversity) and the avoidance of adverse impacts;

d)   require the counterbalancing of residual GHG emissions through appropriate high-quality removals and storage (e.g., investment in long-term nature-based solutions to counterbalance GHG emissions with similar atmospheric lifespans; removal of carbon emissions with permanent geological storage to counterbalance fossil CO_2 emissions);

e)   include sector-specific science-based pathways and decarbonization trajectories;

f)   safeguard society, human settlements, communities and core human needs.

The organization should consider setting and promoting additional more ambitious targets.

Management aspects

The guidelines also focuses on the role of the leadership, policy and advocacy. Targets should take into account needs for inclusivity, fair share and just transition to global Net Zero.

The organization should consider how its net zero strategy aligns with the United Nations SDGs and how it impacts:

–   climate justice and equity;

–   its workforce;

–   indigenous peoples, local communities and minority and vulnerable groups (e.g., women, children, elderly people, people with disabilities);

–   society and cultures;

–   prosperity and eliminating poverty;

–   biodiversity, the integrity of ecosystems and related critical services (e.g., food, water).

Large organizations and those based in developed countries should aim to achieve net zero earlier (potentially well before 2050) than low-emitting countries to contribute to global efforts to limit warming to 1.5°C. If the organization has the capability to contribute beyond its fair share, it should take additional action to achieve its own targets earlier and to assist others in achieving their targets as early as possible by investing in emissions reductions and removals beyond its own boundaries.

The organization should use iterative and adaptive approaches on a regular basis with an increasing level of ambition to achieve interim targets and long-term targets and to address wider impacts, where feasible. The organization should take into account emerging scientific evidence, best practice and external and internal lessons learned.

Appendix IV

UNFCCC Race to Zero

(This appendix does not form an integral part of this Recommendation.)

The Race to Zero campaign gathers a coalition of leading Net Zero initiatives. The 26 partners are responsible for managing their members and keeping them in line with their own internal process as well as the Race to Zero criteria. Over 11,000 non-state members have joined Race to Zero's Partners, representing 8,307 companies, 595 financial institutions, 52 regions, 1136 cities, 1,125 educational institutions, 65 healthcare institutions and 29 other organisations, to collectively halve global emissions by 2030 (as of May 2023).

The UNFCCC campaign, referring to Net Zero as the valid end state for the campaign define Net Zero with the following text:

Referring to the world as a whole, the IPCC defines Net Zero as: When anthropogenic emissions of greenhouse gases to the atmosphere are balanced by anthropogenic removals over a specified period.

Race to Zero considers individual actors to have reached a state of Net Zero when: An actor reduces its emissions following science-based pathways, with any remaining GHG emissions attributable to that actor being fully neutralized by like-for-like removals (e.g., permanent removals for fossil carbon emissions) exclusively claimed by that actor, either within the value chain or through purchase of valid offset credits. [b-RtZ Lexicon].

They further define like-for-like as follows:

When a source of emissions and an emissions sink correspond in terms of their warming impact, and in terms of the timescale and durability of carbon storage. For example, fossil carbon is stable in the lithosphere over millennia if it is not extracted and burned, therefore mitigating measures (e.g., offsets) that aim to neutralize the effect of these emissions must persist for a comparable, geological-timescale. Although all CO_2 once emitted, whether originally sourced from the lithosphere or biosphere, persists in the active carbon cycle for centuries to millennia, it may be appropriate to balance shorter-duration carbon released from biogenic carbon stocks (e.g., forests and soils) with comparably temporary storage in like stocks. The variable risks of reversal of different carbon stocks must also be considered, for example forests may suffer from unforeseen anthropogenic (e.g., illegal logging), non-anthropogenic (e.g., disease and disaster), or climate change-induced (e.g., warming) reversal risks. Protection of nature and sustainable land management is of critical importance to long-term climate stability, and therefore needed for global Net Zero. [b-RtZ Lexicon]

These definitions are then used for the criteria document [b-RtZ Criteria] which outlines their application by the Race to Zero initiative, as shown in Table IV.1.

Table IV.1 – Race To Zero starting line criteria and leadership practices
source: [b-RtZ Criteria]

Starting line	
Pledge	Pledge at the head-of-organization level to reach (net) zero GHGs as soon as possible, and by 2050 at the latest, in line with the scientific consensus on the global efforts to limit warming to 1.5°C with no or limited overshoot, recognising that this requires phasing down and out all unabated fossil fuels as part of a global, just transition. Set an interim target to achieve in the next decade, which reflects maximum effort toward or beyond a fair share of the 50% global reduction in CO_2 by 2030. Targets must cover all greenhouse gas emissions: 1. Including scopes 1, 2 and 3 for businesses and other organisations; 2. Including all territorial emissions for cities and regions; 3. For financial entities, including all portfolio/financed/facilitated/insured emissions; 4. Including land-based emissions.
Plan	Within 12 months of joining, publicly disclose a Transition Plan, City/Region Plan, or equivalent which outlines how all other Race to Zero criteria will be met, including what actions will be taken within the next 12 months, within 2-3 years, and by 2030.
Proceed	Take immediate action through all available pathways toward achieving (net) zero, consistent with delivering your interim targets. Where relevant, contribute to sectoral breakthroughs.
Publish	Report publicly progress against both progress against interim and long-term targets, as well as the actions being taken, at least annually. Report in a standardised, open format, and via platforms that feed into the UNFCCC Global Climate Action Portal.
Persuade	Within 12 months of joining, align external policy and engagement, including membership in associations, to the goal of halving emissions by 2030 and reaching global (net) zero by 2050.
Leadership practices (additional)	
Pledge	Reduce emissions to absolute zero with no remaining residual emissions, or go further and ensure your activities remove more GHGs than they produce. See Lexicon for further details. Adopt inclusive boundaries Widen the scope of your target to include cumulative emissions, especially where these are significant (for all actors) and / or consumption emissions (for cities, states, and regions). See Lexicon for further details. Set twin targets for reductions and removals. In addition to your emissions reductions targets, compensate for any unabated emissions year on year through investment in high quality carbon credits, disclose neutralisation milestones that demonstrate the integrity of commitments to neutralise unabated emissions and state how you plan to ultimately neutralise any residual emissions by 2050 through high-quality, permanent removals. Set specific targets for short-term reduction of methane and other GHGs Pledge to reduce methane emissions by at least 34% by 2030, in line with the IPCC's 6th Assessment Report, and make near-term pledges to reduce other high global warming potential GHG emissions. Protect nature Pledge to halt deforestation and protect biodiversity, making your activities consistent with climate resilient development. Pledge to make finance consistent with climate resilient development including ending deforestation and conversion of other natural ecosystems, and

Table IV.1 – Race To Zero starting line criteria and leadership practices
source: [b-RtZ Criteria]

Starting line	
	respecting biodiversity. Contribute to 2030 Breakthroughs Set sectoral targets in line with the 2030 Breakthroughs or more ambitious sector targets. For financial institutions, use sector-specific targets that drive emissions reductions and do not simply shift investment from high-emitting to low-emitting sectors.
Plan	1) In the transition to (net) zero, prioritize reducing emissions, limiting any residual emissions to those that are not feasible to eliminate. 2) Clearly specify what sinks or credits are used to make what, if any, neutralization claims, clarifying how sinks and credits are used both on the path to (net) zero, and after (net) zero is obtained. Any neutralization of residual emissions must transition to permanent removals by the time (net) zero status is achieved. 3) Encourage immediate contributions to the preservation and restoration of natural sinks, not necessarily linked to neutralization claims. 4) Ensure that any credits achieve robust outcomes for additionality, permanence, and accounting, and do not undermine social justice or harm biodiversity. 5) Support a just transition. Explain how you will support communities affected by both climate impacts and the climate transition, and strengthen their participation in achieving the global goal of halving emissions by 2030, seeking to address injustices and build towards a more equitable future. 6) Integrate nature. Drawing on the Convention on Biological Diversity, integrate the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies. Empower stakeholders 7) Explain what actions you will take to empower other stakeholders in your community and beyond to achieve their own targets, embracing the spirit of radical collaboration. Include how you will support the Sustainable Development Goals. 8) Identify in your plan how you will help build the resilience of, and drive funding to, developing countries to achieve a just, inclusive transition.
Proceed	Seek to enable all actors to contribute to the global transition toward (net) zero through engagement, information sharing, access to finance, and capacity building. Develop pledges, plans, and actions in consideration of equity, drawing on, inter alia, the sustainable development goals and Articles 2 and 4 of the Paris Agreement. Contribute beyond your own territory / value chain In addition to following a science-aligned Net Zero pathway to reduce your own emissions and neutralise any residual emissions that remain, contribute toward global (net) zero through beyond value chain / territorial mitigation efforts, such as the purchase and retirement of high-quality carbon credits (emission reductions, avoidance or removals) that do not substitute for nor delay emissions reductions necessary to meet the Pledge. Prioritise emissions-intensive sectors Take immediate action to protect standing forests and avoid and reduce emissions in the most GHG-intensive activities and sectors, while not neglecting longer-term efforts. Align to the 2030 Breakthroughs sectoral targets. Scale up climate solutions Proactively grow activities that contribute to the achievement of global net

Table IV.1 – Race To Zero starting line criteria and leadership practices
source: [b-RtZ Criteria]

Starting line	
	zero, such as new technologies, business models, policy approaches, and community practices. Empower your ecosystem Empower those in your ecosystem to implement Race to Zero plans, including through financing, capacity building, knowledge-sharing, and access to resources. In particular for financial institutions, scale-up investment in emerging markets and developing countries
Publish	Report on progress in and beyond your value chain or territory Outline progress both regarding within-value-chain / territorial emissions reductions and investment made / action taken outside of your value chain / territory. Report on how you have allocated resources and capacities to achieve the short-term and longer-term targets.
Persuade	Activate the ambition loop Proactively advocate for your peers, stakeholders, and governments to align their goals and actions to 1.5C. Demonstrate how the implementation of your own ambitious targets creates opportunities for others to follow. Mainstream (net) zero alignment Advocate for appropriate regulation and facilitating measures to ensure that alignment to 1.5C becomes the default for all actors.

Together these definitions and criteria set some basic principles:

•   Net Zero is a future state with remaining emissions being only those that cannot be reduced.

•   The main vehicle towards Net Zero is reduction of own emissions and reduction efforts shall be priority.

•   Scope 3 is considered as being own emissions.

•   Organizations shall follow a science-based pathway aiming towards and beyond a fair share of halving of global emissions by 2030 compared to 2015 levels and must reflect this in an interim target.

•   Any removal to balance residuals shall follow like-for-like principles and be permanent when Net Zero status is claimed.

•   Any use of sinks and credits must be clearly explained.

Following UNFCCC's theory of change, having 20% of a sector committing to Net Zero is considered as a tipping point [b-RtZ Mobile operators]. In January 2021, the mobile operators were the first sub-sector to reach this major moment. At this point, 36% of the mobile operators by revenue, and 31% of the mobile operators by connections, are in the Race to Zero. A list of participating mobile operators is given at https://racetozero.unfccc.int/mobile-sector-breakthrough/. Moreover, mobile operators with science-based carbon emission reduction targets cover 50% of mobile connections and 65% of industry revenues globally.

Closely related to the Race to Zero, the UNFCCC Climate Champions team has worked to develop the climate action pathways which represent a vital part of the Marrakech Partnership for Climate Change toolbox [b-UNFCCC Marrakech] to enhance climate action and ambition towards fully implementing the Paris Agreement [b-UNFCCC PA]. First launched in 2019, these pathways set out sectoral visions for achieving a 1.5°C resilient world in 2050, with overarching transformational milestones, and key impacts that need to be achieved to realize them. The latest publicly available version was produced in 2021 [b-UNFCCC Pathways]. The ICT sector is addressed within the industry pathway [b-UNFCCC Industry].

Appendix V

SBTi Net Zero

(This appendix does not form an integral part of this Recommendation.)

The Science Based Targets initiative (SBTi) is a partnership between the Carbon Disclosure Project (CDP), the United Nations Global Compact, World Resources Institute (WRI) and the World Wide Fund for Nature (WWF). The SBTi call to action is one of the "We Mean Business Coalition" commitments. The initiative drives ambitious climate actions in the private sector by enabling organizations to set science-based emissions reduction targets.

As a start to their Net Zero methodology work, SBTi investigated the current use of the Net Zero concept. They identified that corporate Net Zero targets differed across three important dimensions:

• 	the range of emission sources and activities included;

• 	the timeline;

• 	how organizations are planning to achieve their target.

Moreover, they have included the following decarbonization approaches:

• 	eliminating sources of emissions within the value chain of the organization (i.e., an organization of scope 1, 2, and 3 emissions);

• 	removing CO_2 from the atmosphere; and

• 	compensating for value chain emissions by helping to reduce emissions outside of the value chain (e.g., through the provision of finance).

SBTi presents the need to reach the Net Zero status at a global level as a desired state compared with the current situation, this is illustrated in the Figure V.1.
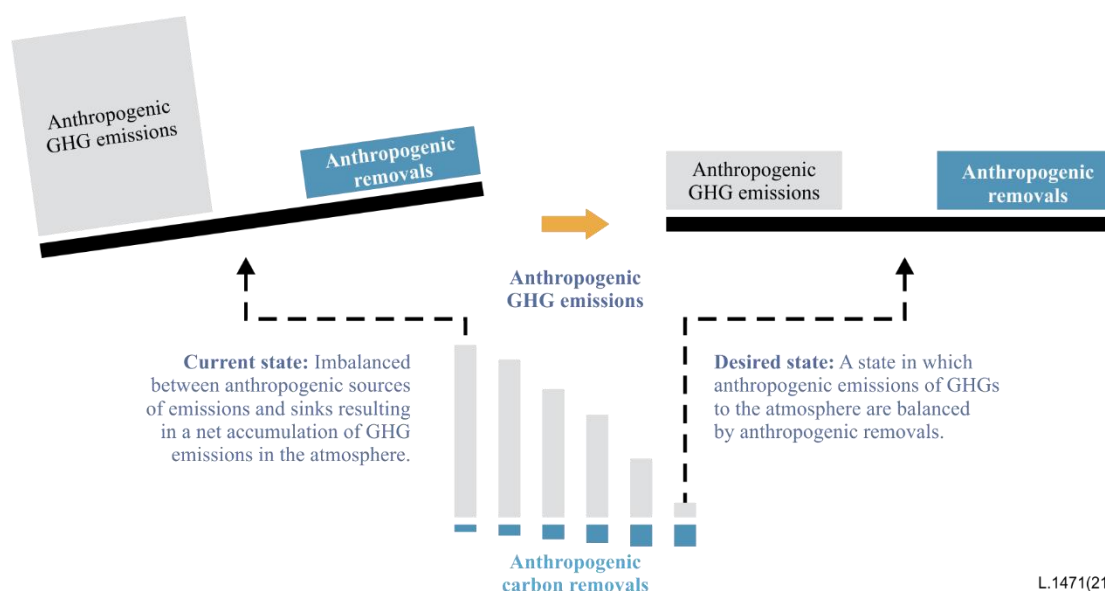

Figure V.1 – The desired state versus current state related to anthropogenic emissions
source: [b-SBTi Net Zero I]

This resulted in the following key recommendations:

- **Boundary**: An organization Net Zero target should cover all material sources of GHG emissions within its value chain.

- **Transparency**: Organizations should be transparent about the sources of emissions included and excluded from the target boundary, the timeframe for achieving Net Zero emissions, the amount of abatement and neutralization planned in reaching Net Zero emissions, and any interim targets or milestones.

- **Abatement**: Organizations must aim to eliminate sources of emissions within their value-chain at a pace and scale consistent with mitigation pathways that limit warming to 1.5°C with no or limited overshoot (i.e., this is associated with preventing the release of GHGs at the source). During an organization transition to Net Zero, compensation and neutralization measures may complement, but not substitute, reduction of value chain emissions in line with science. At the time that Net Zero is reached, emissions that are not feasible for society to abate may be neutralized with an equivalent measure of CO_2 removals. This is defined as neutralizing the impact of any source of residual emissions that remain unfeasible to be eliminated by permanently removing an equivalent amount of atmospheric carbon dioxide. It is further stated that 1.5°C-aligned mitigation pathways should be the basis for determining the level of residual emissions for different activities and sectors of the economy at different points in time.

NOTE – The concept 'abatement' as used by SBTi covers emission reduction and removals.

- **Timeframe**: Organizations should reach Net Zero GHG emissions by no later than 2050. While earlier target years are encouraged, a more ambitious timeframe should not come at the expense of the level of abatement in the target.

- **Accountability**: Long-term Net Zero targets should be supported by interim science-based emission reduction targets to drive action within timeframes that are aligned with corporate planning and investment cycles and to ensure emission reductions that are consistent with Paris-aligned mitigation pathways.

- **Neutralization**: Reaching Net Zero emissions requires neutralizing organization residual GHG emissions with an equivalent amount of carbon removals. An effective neutralization strategy involves removing carbon from the atmosphere and storing it for a long-enough period to fully neutralize the impact of any GHG that continues to be released into the atmosphere.

- **Compensation**: While reaching a balance between emissions and removals is the end goal of a Net Zero journey, organizations should consider undertaking efforts to compensate unabated emissions in the transition to Net Zero as a way to contribute to the global transition to Net Zero.

- **Mitigation hierarchy**: Organizations should follow a mitigation hierarchy that prioritizes eliminating sources of emissions within the value chain of the organization over-compensation or neutralization measures. Land-based climate strategies should prioritize interventions that help preserve and enhance existing terrestrial carbon stocks, within and beyond the value chain of the organization.

- **Environmental and social safeguards**: Mitigation strategies should adhere to robust social and environmental principles, ensuring amongst others, protection and/or restoration of naturally occurring ecosystems, robust social safeguards, and protection of biodiversity, amongst others.

- **Robustness**: Compensation and neutralization measures should: (a) ensure additionality, (b) have measures to assure permanence of the mitigation outcomes, (c) address leakage and (d) avoid double-counting.

The SBTi document [b-SBTi Net Zero I] also distinguishes between the transition towards Net Zero and the Net Zero state.

In particular, SBTi refers to removals and states that organizations may reach a balance between emissions and removals before they reach the depth of decarbonization required to limit warming to 1.5°C. While this represents a transient state of Net Zero emissions, it is expected that organizations will continue their decarbonization journey until reaching a level of abatement that is consistent with 1.5°C pathways.

The SBTi document further distinguishes between actions that organizations take to help society avoid or reduce emissions outside of their value chain (compensation measures) and measures that organizations take to remove carbon from the atmosphere within or beyond the value chain (neutralization measures).

NOTE 1 – SBTi uses the term "neutralization" in the context of removals, explaining that "to neutralize" is to "render something ineffective or harmless by applying an opposite force or effect". Accordingly, the removal and permanent storage of atmospheric carbon is a measure that, theoretically, can neutralize or counterbalance the effect of releasing CO_2 and other GHGs into the atmosphere".

NOTE 2 – SBTi refers to emissions avoidance as "compensation" referring to "measurable GHG emission reductions, resulting from actions outside of the value-chain of an organization that compensate for emissions that remain unabated within the value-chain of an organization". SBTi indicates in its document that "Compensation measures commonly used by organizations include direct investment in emission reduction activities, purchase of carbon credits, and avoided emissions through the use of sold products, amongst others".

SBTi sees two roles for compensation and neutralization related actions:

- In the transition to Net Zero: Organizations may opt to compensate or to neutralize emissions that are still being released into the atmosphere while they transition towards a state of Net Zero emissions;

- At Net Zero: Organizations with residual emissions within their value chain are expected to neutralize those emissions with an equivalent amount of carbon dioxide removals;

While seeing a role for such measures, it is stated that these do not replace the necessity of reducing value chain emissions in line with science.

NOTE 3 – The Swedish Consumer Agency recently published a memorandum regarding environmental statements where they put forward offset claims in the context of Net Zero and other similar concepts as lacking precision and clarity. They also stated that average consumers could not be expected to understand such claims. Even statements that are correct may be considered misleading depending on context and the impression they create. Though documents from one single market could not be used to make global conclusions this example shows that although offsetting is accepted organizations should be careful in how such activities are referred to [b-SCA].

In particular SBTi summarizes the role of nature-based climate solutions in corporate science-based Net Zero strategies as follows:

- **As part of an organization emissions abatement plan**: Organizations with land-use intensive business models must aim to eliminate deforestation from their supply chains by no later than 2030.

- **As a compensation measure**: Organizations in all sectors can catalyse action that preserves or enhances existing carbon stocks as part of an effort to compensate emissions as they transition toward a state of Net Zero emissions. This should prioritise interventions with strong co-benefits and that contribute to achieving other social and environmental goals.

- **As a neutralization measure**: Organizations with emissions that are not feasible for society to abate can resort to nature-based carbon removal measures to counterbalance the impact of unabated emissions. Interventions that contribute to restoring natural ecosystems

are preferred, and organizations should avoid interventions with the potential to create additional land-use pressure.

An overview of mitigation measures is given in Figure V.2.
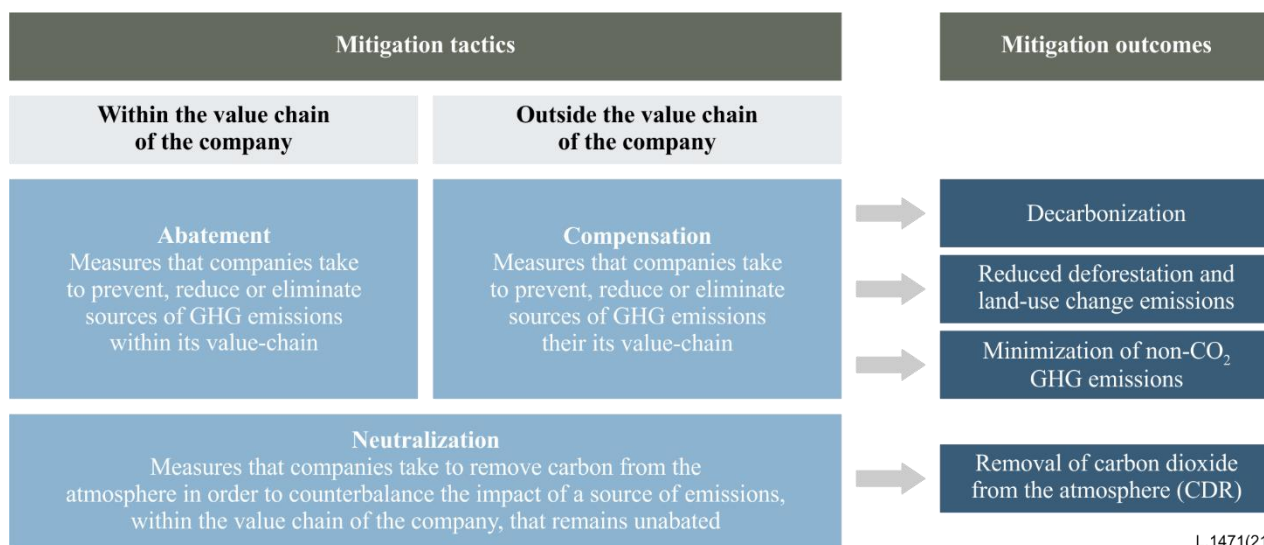
Figure V.2 – Summary of decarbonization strategies and terminology
source: [b-SBTi Net Zero I]

SBTi also summarizes priorities and the validity of corporate Net Zero claims in Figure V.3.

Strategy	Value chain emissions abatement	Measures to balance unabated value chain emissions	Principe 1: Consistent with no net accumulation of GHGs in the atmosphere?	Principe 2: Consistent with the attainment of the Paris Agreement and SDGs?	Principe 3: Business model resilient in a net zero economy?
Strategy 1 Replacing abatement with carbon credits representing emission reductions	Value chain emissions are abated by an arbitrary amount	Unabated emissions are balanced by carbon credits representing emission reductions	No	No. The Paris Agreement cannot be attained without halting accumulating of GHGs in the atmosphere	No. Retaining a relatively high-emissions business model is unlikely to meet stakeholder expectations
Strategy 2 Replacing abatement with avoided emissions		Unabated emissions are balanced by avoided emissions due to sold products or services			
Strategy 3 Replacing abatement with negative emissions		Unabated emissions are balanced by an appropriate amount of CO_2 removal	Yes, if CO_2 sequestration is permanent	No. Overreliance on CO_2 removal generates trade-offs with other social and environmental goals	Uncertain. Overreliance on negative emissions may not address stakeholder expectations
Strategy 4 Abatement of emissions in line with science	Value chain emissions are abated at a rate consistent with Paris-aligned climate change mitigation scenarios	Unabated emissions are balanced by an appropriate amount of CO_2 removal	Yes, if CO_2 sequestration is permanent	Yes	Yes
Strategy 5 Climate positive approach		During the transition to net zero, unabated emissions are compensated When net zero is achieved, emissions are balanced with an appropriate amount of CO_2 removal			

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Figure V.3 – Summary of decarbonization strategies and terminology
source: [b-SBTi Net Zero I]

Strategies 4 and 5 give priority to GHG emissions reductions respecting a 1.5°C trajectory. According to strategies 4 and 5, scope 1, 2 and 3 emissions (Note: SBTi uses the term "value chain emissions") are to be reduced (Note: SBTi uses the term "abated") at a rate consistent with emission pathways that meet the ambition of the Paris Agreement, limiting warming to 1.5°C in 2100 compared to pre-industrial levels.

More recently SBTi published the SBTi Net Zero Standard [b-SBTi Net Zero II] which defines corporate Net Zero as:

Reducing scope 1, 2, and 3 emissions to zero or a residual level consistent with reaching global Net Zero emissions or at a sector level in eligible 1.5°C-aligned pathways; and

Permanently neutralizing any residual emissions at the Net Zero target year and any GHG emissions released into the atmosphere thereafter. Neutralization of unabated emissions to reach net-zero: Companies shall remove carbon from the atmosphere and permanently store it to counterbalance the impact of any unabated emissions that remain once companies have achieved their long-term science-based target, and for subsequent years thereafter. The neutralization of unabated emissions applies to both the emissions reduction target(s) boundary and to any unabated emissions that have been excluded from the GHG inventory.

To contribute to societal Net Zero goals, companies are strongly encouraged to go further than their science-based abatement targets to mitigate emissions beyond their value chains. The Net-Zero Standard sets out four key elements that make up a corporate Net Zero target:

- Near-term science-based target (5-10 year GHG mitigation targets in line with 1.5°C pathways);
- Long-term science-based target;
- Neutralization of any residual emissions;
- Beyond value chain mitigation (BVCM).

These targets show companies how much they must reduce value chain emissions to align with reaching Net Zero at the global or sector level in eligible 1.5°C pathways by 2050 or sooner. A company cannot claim to have reached Net Zero until the long-term science-based target for all scopes is achieved and the company has neutralized residual emissions.

The principle at the heart of the SBTi Net-Zero Standard is the 'mitigation hierarchy'. Under the mitigation hierarchy, companies should set near- and long-term science-based targets.

Setting and achieving science-based targets must take precedence – however, companies should go further and invest in mitigation outside their value chains to contribute towards reaching societal netzero. The SBTi recommends that companies prioritize securing and enhancing carbon sinks (terrestrial, coastal and marine, etc.) to avoid the emissions that arise from their degradation.

Pathways used by the SBTi aim to steer voluntary climate action and contribute to achieving the 1.5°C objective of the Paris Agreement and the sustainable development goals (SDGs), reaching Net Zero CO_2 emissions at the global level by 2050 and Net Zero GHG emissions in 2050 or later.

1.5ºC-aligned pathways used by the SBTi stay within a 500 gigaton carbon budget under the assumption of about 20-40 gigatons of cumulative CO_2 removal by 2050.

Companies need to establish a base year to track emissions performance consistently and meaningfully over the target period. The following considerations are important for selecting a base year: 1. Scope 1, 2, and 3 emissions data should be accurate and verifiable. 2. Base year emissions should be representative of a company's typical GHG profile.5 3. The base year should be chosen so that targets ha.ve sufficient forward-looking ambition. 4. The base year must be no earlier than 2015.

Companies are required to have a comprehensive emissions inventory that covers at least 95% of company-wide scope 1 and 2 GHG emissions and includes a complete scope 3 inventory.

Near-term science-based targets must cover at least 95% of company-wide scope 1 and 2 emissions. When scope 3 emissions make up 40% or more of total emissions (scope 1, 2, and 3 emissions), companies must set one or more emission reduction targets and/or supplier or customer engagement targets that collectively cover(s) at least two-thirds (67%) of total scope 3, considering the minimum boundary of each category in conformance with the GHG protocol corporate value chain (scope 3) accounting and reporting standard. Long-term science based targets (SBTs) must cover at least 95% of company-wide scope 1 and 2 emissions and 90% of scope 3 emissions.

Renewable electricity (scope 2 only): Using this method, companies set targets to actively procure at least 80% renewable electricity by 2025 and 100% renewable electricity by 2030. Renewable electricity targets are accepted as a substitute for targets that cover scope 2 emissions.

Figure V.4 provides a summary of long-term and near-term science based targets.

		Boundary What percentage emissions inventory coverage is required?	**Ambition** What is the ambition level of limiting temperature rise?	**Timeframe** What is the timeframe to meet targets?	**Methods** What are the eligible methods to set targets?
Near-term SBTs	**Scope 1 and 2**	95%	1.5°C	5-10 years[9]	Cross-sector absolute reduction Sector-specific absolute reduction Sector-specific intensity convergence Renewable electricity
	Scope 3	If >40% of total emissions, 67% coverage	Well-below 2°C		Cross-sector absolute reduction Sector-specific absolute reduction Sector-specific intensity convergence Supplier/customer engagement Scope 3 economic intensity reduction Scope 3 physical intensity reduction
Long-term SBTS	**Scope 1 and 2**	95%	1.5°C	2050 latest (2040 for the power and maritime transport sectors)	Cross-sector absolute reduction Sector-specific absolute reduction Sector-specific intensity convergence Renewable electricity
	Scope 3	90%			Cross-sector absolute reduction Sector-specific absolute reduction Sector-specific intensity convergence Scope 3 economic intensity reduction Scope 3 physical intensity reduction

Figure V.4 – Summary of long-term and near-term science based targets

Appendix VI

UNFCCC Climate Neutral Now initiative

(This appendix does not form an integral part of this Recommendation.)

The Climate Neutral Now initiative is one of several initiatives launched by the UN Framework Convention on Climate Change (UNFCCC) secretariat to increase climate action by engaging non-party stakeholders (sub-national governments, organizations, organizations, individuals). It was launched in 2015 based on a mandate to promote the voluntary use of carbon market mechanisms recognized under the UNFCCC Convention.

It has evolved to become a much wider tool for awareness-raising, capacity building, partnership development, promoting and facilitating the estimation of carbon footprints, the reduction of those footprints, and voluntary compensation.

The Climate Neutral Now Initiative encourages and supports organizations and other interested stakeholders to act now in order to achieve a climate neutral world by 2050 as enshrined in the Paris Agreement. It is a tool to promote additional voluntary action on climate, and to provide recognition for it.

Claims of carbon neutrality, Net Zero or similar aims are out of the scope of the Climate Neutral Now initiative. Instead, UNFCCC addresses Net Zero as part of the Race to Zero initiative (see clause 7.1).

Participants follow the three steps (measure, reduce, contribute) and report on their actions and achievements annually. This approach is illustrated in Figure VI.1.
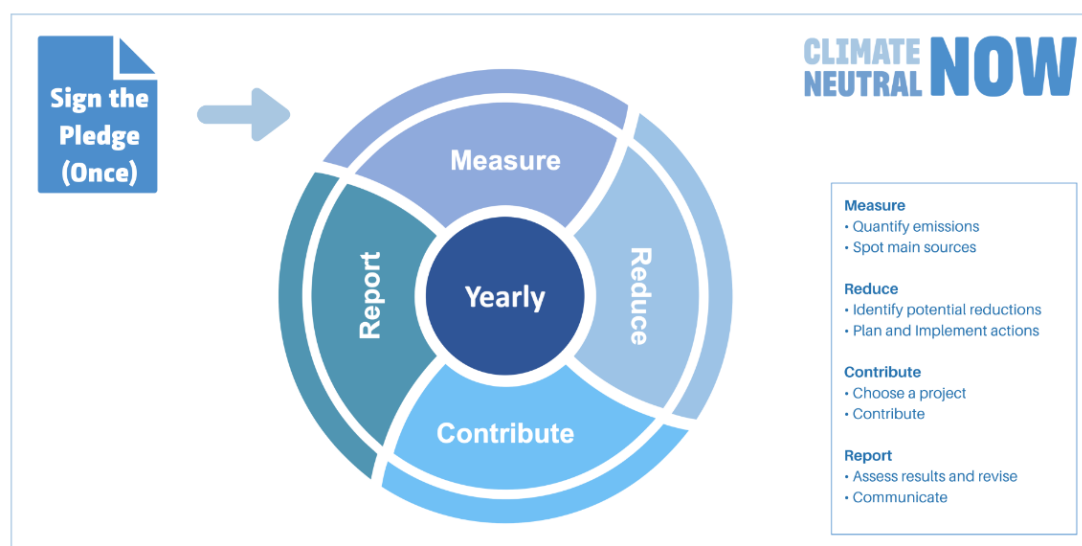

Figure VI.1 – Climate Neutral Now approach
source: UNFCCC website April 2021

Appendix VII

Net Zero initiative

(This appendix does not form an integral part of this Recommendation.)

The Net Zero initiative is a private initiative by a French consulting organization, developed in cooperation with organizations and supported by a scientific council. This initiative defines how organizations can contribute to Net Zero at global level and released a publication on the topic in April 2020.

The Net Zero initiative recommends that organizations contribute to Net Zero at global level across three pillars as described in Figure VII.1.

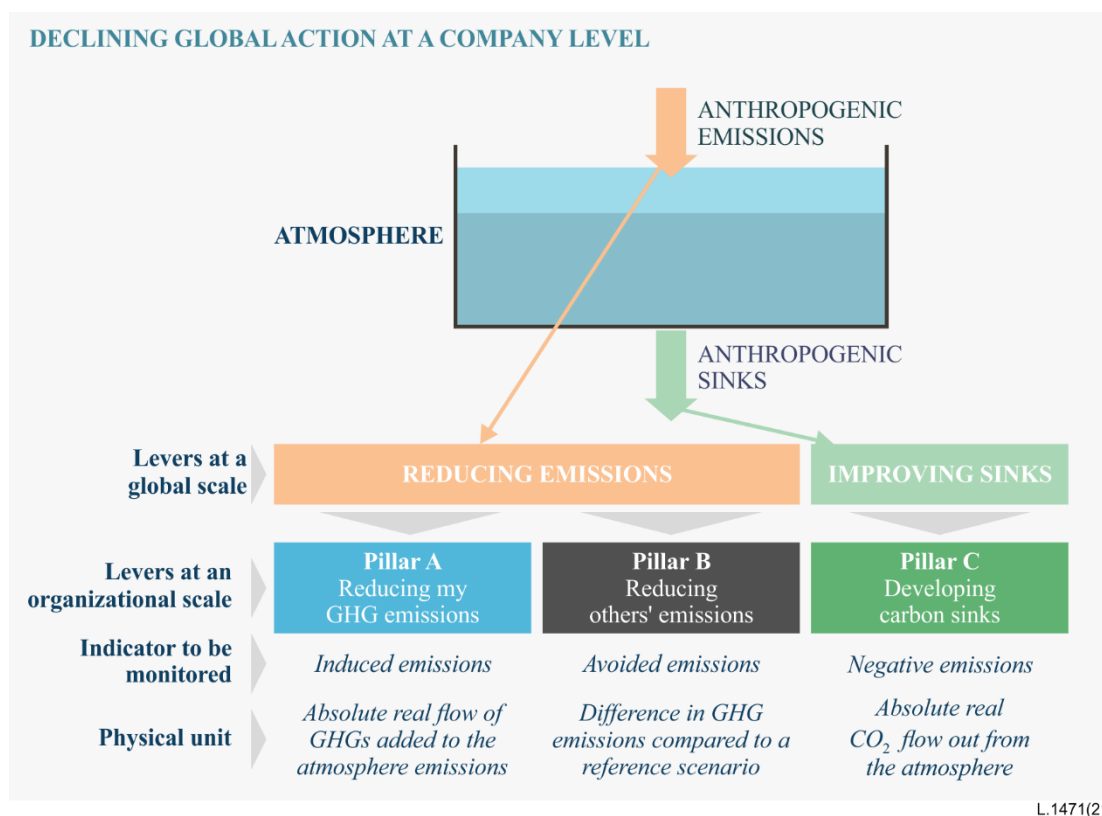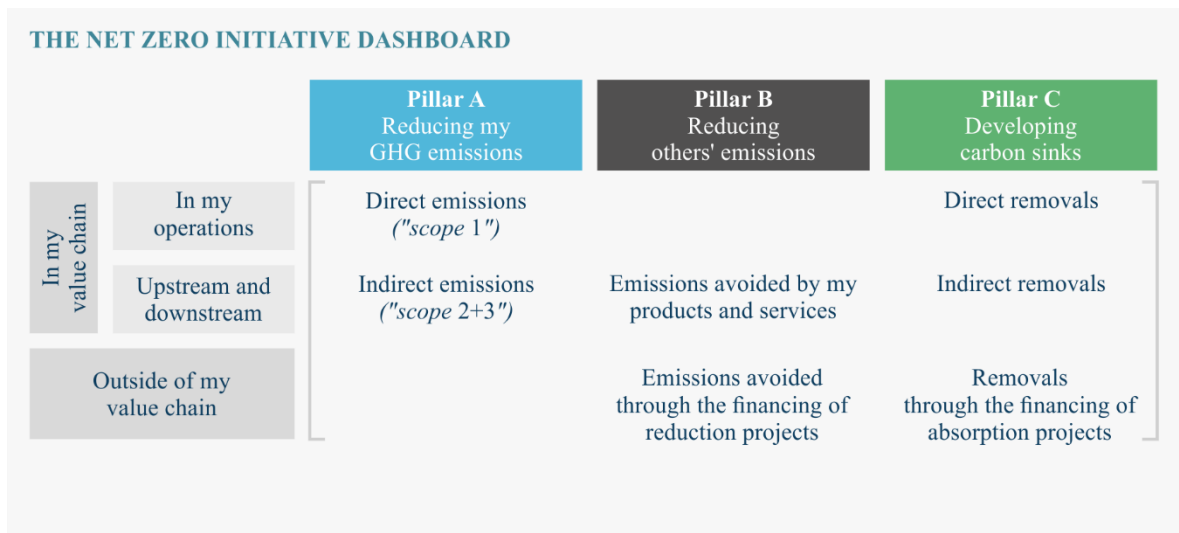**Figure VII.1 – Declining Net Zero global action to organization level**
source: [b-NZI Framework]

The framework is based on several key principles:

- Net Zero is only used to refer to the global goal of balancing the emissions and removals.
- Organizations can contribute to the trajectory towards global Net Zero.
- The three pillars shown in the Figure VII.2 shall be rigorously distinguished and counted separately.

THE NET ZERO INITIATIVE DASHBOARD

		Pillar A Reducing my GHG emissions	Pillar B Reducing others' emissions	Pillar C Developing carbon sinks
In my value chain	In my operations	Direct emissions *("scope* 1*")*		Direct removals
	Upstream and downstream	Indirect emissions *("scope* 2+3*")*	Emissions avoided by my products and services	Indirect removals
Outside of my value chain			Emissions avoided through the financing of reduction projects	Removals through the financing of absorption projects

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Figure VII.2 – Net Zero initiative dashboard at organization level
source: [b-NZI Framework]

Each organization is then encouraged to:

• Measure its performance on these three pillars;

• Set ambitious objectives for each of them;

• Manage them dynamically over time.

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