GREENHOUSE GAS SCIENCE-BASED TARGETS
GUIDANCE FOR UN ORGANISATIONS

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GREENING THE BLUE

UN environment programme

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EXECUTIVE SUMMARY

In October 2018, the International Panel on Climate Change (IPCC) released the Special Report on Global Warming of 1.5°C approved by governments. The report advocates for a limitation of global warming to 1.5°C. The Strategy for Sustainability Management in the UN System 2020-2030 Phase I was approved by the Chief Executive Board (CEB) in 2019 and states that the UN system needs to align its own practices with the 1.5°C target if it wants to be a credible advocate for climate action. To set credible targets it is recognised that there is a need to set science-based targets (SBT).

While the overall scientific consensus on climate change is clear, understanding on the science behind it is evolving; it is complex and can be very technical. It is therefore important to note, as a principle of target setting, that **understanding of the science may change and, if so, a possibly more challenging emissions reduction scenario may be necessary.** SBTs should be understood in this context and be used as a tool to align with the 1.5°C target as much as possible.

This document was developed by UNEP's Sustainable United Nations (SUN) facility in collaboration with the Issue Management Group on Environmental Sustainability Management as a guide for UN organisations to understand and set SBTs that support the overall objectives of the UN 2020-2030 Sustainability Strategy. It is intended for UN staff who are already working in the area of GHG emissions reductions and target setting or for their management.

This document should be used in conjunction with supports and advice available through the SUN team. A general level of awareness of GHG reductions is assumed.

The document covers the main issues to be considered for Greenhouse Gas (GHG) target setting and outlines specific guidance and recommendations. These guidance and recommendations include:

- The UN System has committed to the 1.5°C warming scenario
  - This effectively means an absolute 45% GHG reduction from 2010 to 2030
- The UN System commits to set science-based targets
- The baseline year for the UN System should be 2010
  - When data is unavailable for 2010, with advice from SUN, UN entities should 'backcast' as accurately as possible a 2010 baseline (the UN Target Setting Calculation Sheet is available to assist entities with backcasting).
- The target year for the UN System should be 2030
  - Though the recommended initial target year is 2030, UN entities should remain cognisant of the need to keep reducing emissions beyond 2030 in line with the IPCC recommendation of net zero by 2050.
- UN entities should set absolute and intensity targets while remaining cognisant of cumulative emissions
- UN entities should, at a minimum, plan for a steady reduction scenario and aim for a react early scenario where practicable

INTRODUCTION

BACKGROUND

In October 2018, the International Panel on Climate Change (IPCC) released the Special Report on Global Warming of 1.5°C approved by governments. The report advocates for a limitation of global warming to 1.5°C, instead of the previously agreed 2°C, and indicates the advantages to ecosystems and societies of such ambition. According to the report, "limiting global warming to 1.5°C would require 'rapid and far-reaching' transitions in land, energy, industry, buildings, transport, and cities. Global net human-caused emissions of carbon dioxide (CO_2) would need to fall by about 45 % from 2010 levels by 2030, reaching 'net zero' around 2050." Remaining emissions would need to be balanced by removing CO_2 from the air.

Limiting global warming to 1.5°C will require changes on an unprecedented scale at all levels, including:

- Governance consistent with limiting warming to 1.5°C
- Deep emissions cuts in all sectors
- Technological innovation
- Behavioural changes and demand side management
- Increased investment in low carbon options for infrastructure and buildings

In December 2018, the UN Secretary-General asked the UN system to raise the level of its internal environmental sustainability ambitions and to intensify its efforts to combat climate change from within. Specifically, the Secretary-General highlighted at the September 2019 UN Climate Summit that the UN system is "walking the talk" on environmental sustainability and climate change.

The Strategy for Sustainability Management in the UN System 2020-2030 Phase I was approved by the CEB in 2019. It states that the '... IPCC and the UN System are calling the world to take concrete action to limit global temperature increases to 1.5°C above pre-industrial levels. As any other actor in society, the United Nations needs to align its own practices with these goals if it wants to be a credible advocate for climate action.'

The UN System, as a whole, strongly advocates for the setting of targets that align with the IPCC recommendations internationally, such as through the annual UNEP Emissions Gap Report and the UN Global Compact's support of the Science Based Targets initiative (SBTi), both geared towards governments and specific sectors.

Building on the success of Greening the Blue and on the 2019 CEB commitment to adopt suitable targets[1], there has been significant interest from within the UN System on target setting. Interest has focused on how to set credible targets, specifically on science-based targets (SBT).

1 Strategy for Sustainability Management in the UN System, 2020-2030 https://unemg.org/wp-content/uploads/2019/09/INF_3_Strategy-for-Sustainability-Management-in-the-UN-System.pdf

THE SCIENCE AND THE ROLE OF THE IPCC

The Intergovernmental Panel on Climate Change (IPCC) provides the world with objective, scientific information relevant to understanding climate change. The IPCC does not carry out original research. It assesses published literature, including peer-reviewed and non-peer-reviewed sources. Thousands of scientists and other experts contribute on a voluntary basis to writing and reviewing reports, which are then reviewed by governments. The IPCC has published five detailed assessment reports, starting in 1990 and followed by reports in 1995, 2001, 2007 and 2014. It is working on a sixth report due in 2022.

Additionally, the IPCC produces special reports as needed. The 2018 IPCC Special Report on Global Warming of 1.5°C approved by Governments advocates for a limitation of global warming to 1.5°C. This is based on a reasoned comparison of the implications of a 1.5°C warming scenario to a 2°C scenario. The IPCC assesses that to align with the 1.5°C scenario, GHG emissions would need to fall by about 45% from 2010 levels by 2030, and reach 'net zero' by 2050.

EVOLVING SCIENTIFIC UNDERSTANDING

While there is a clear scientific consensus on the overall trends of global warming, the IPCC assesses a huge body of research for each report, and the specific results of these individual research studies can vary. The IPCC uses specific language covering evidence, agreement and confidence to describe the research it reviews:

"The following summary terms are used to describe the available evidence: limited, medium, or robust; and for the degree of agreement: low, medium, or high. A level of confidence is expressed using five qualifiers: very low, low, medium, high, and very high...."[2]

The science is complex, and efforts to understand and interpret the science are ongoing. The IPCC publishes summaries of their findings for policymakers to assist in decision making. It is important to note, as a principle of target setting, that **understanding of the science may change and, if so, a possibly more challenging emissions reduction scenario may be necessary**. This is an important factor to consider for UN entities when it comes to setting ambition and reviewing targets regularly.

WHAT ARE SCIENCE-BASED TARGETS?

For the purposes of this document, SBTs are GHG reduction targets that align with the most up-to-date climate science. More specifically, these are targets that are based on current or baseline GHG inventories and mapped to a future state of reduced emissions consistent with the IPCC's AR5 report 1.5°C scenario.

This is not to be confused with the Science Based Targets Initiative (SBTi), which is a collaboration between the Carbon Disclosure Project (CDP), the United Nations Global Compact (UNGC), the World Resources Institute (WRI), and the World Wildlife Fund (WWF) and focuses on working with the private sector to set and validate science-based targets.

2 IPCC AR5 Summary for Policymakers, pg. 4

WHY SET SCIENCE-BASED TARGETS?

The primary reason to set SBTs is to support confidence and give credibility to climate action. They also support economising effort appropriately so that resources can be channelled towards the most appropriate GHG mitigation actions. They can support innovation, reduce uncertainty, improve cost management and allow the development of a predictable level of investment in climate action over time.

RECOMMENDED APPROACH FOR SCIENCE-BASED TARGETS IN THE UN SYSTEM

LEADERSHIP AND AMBITION

The UN System has unambiguously committed to be a leader in this area. The 2030 vision for sustainability management set in the Strategy for Sustainability Management in the UN System 2020-2030 that was approved by the CEB in 2019 is:

"The United Nations system is a leader in integrating environmental and social sustainability considerations across its work in a systematic and coherent way, practicing the principles that it promotes and leaving a positive legacy."

GUIDELINE

THE BASELINE YEAR FOR THE UN SYSTEM SHOULD BE 2010.

The strategy also states that "the UN System needs to align its own practices with the recommendations of the IPCC report to ensure that its facilities, operations, projects and programmes support the efforts of governments to mitigate climate change and not the other way around."

This document assumes acceptance by all entities of the IPCC position on the 1.5° C scenario.

CONSIDERATIONS TO SET AN SBT

Data quality and current inventories
Ideally, a target should be determined in the context of an entity having a high-quality data set and high confidence in its current inventory. Furthermore, to demonstrate progress towards and achievement of a target, UN entities should work to maintain high data quality. Hence, **one of the key implications of setting an SBT will be an ongoing commitment to improved data collection mechanisms**, minimising the use of proxies and estimation as much as practicable. It is important to resolve any substantial doubts or uncertainties about current inventories before committing to a particular target. In the context of poor data availability or significant doubt about an organisation's inventory, it is still possible and worthwhile to set challenging targets. The team at SUN will be able to advise on improving data collection mechanisms.

Baseline date and inventory integrity
For the UN system, in line with the IPCC recommendations which are the best available climate science, the baseline year should be 2010. If an entity had a high-quality inventory in 2010 but had data quality issues since then, it would still be legitimate to use 2010 as the baseline year for target purposes.

BASELINE YEAR DIFFICULTIES

Several entities do not have GHG data from 2010 or, because GHG reporting was fairly new to the UN System in 2010, are not confident in the quality of their GHG data from 2010. Based on the data availability and data confidence, each entity should decide on the best way to estimate its 2010 baseline emissions in consultation with SUN.

Below are possible methods for "backcasting" emissions to develop a 2010 baseline:

Method 1: Assume that the emissions throughout the years going back to 2010 are constant and equal to the emissions from the first year with accurate data.

Example: If entity A considers 2017 to be its first year of reliable data, the annual emissions each year from 2010 to 2016 are equal to the 2017 emissions.

This method is probably the most conservative in ensuring that an entity reduces its emissions by at least 45% because it does not take credit for the downward trend of UN System GHG emissions prior to an individual entity's first year of reliable data. UN System GHG emissions have decreased over the years due to both internal efforts made by entities and external factors, such as an increased use of renewable energy in many of the country electricity grids that supply UN offices.

Method 2: Estimate 2010 emissions based on the emissions trend of the entity's first three or more years of accurate data.

Example: If entity A considers 2017 to be its first year of reliable data, the trend line formed by 2017, 2018 and 2019 emissions will be used to extrapolate 2010 emissions.

This is the recommended method for entities with at least 3 years of reliable data and a steady data trend. However, this method may be difficult to apply if there is no perceptible data trend.

Method 3: Assume that prior to an entity's first year of accurate data, the entity's GHG emissions decreased following the average trajectory of the UN System as a whole back to 2010. Based on the UN System's downward trend in per capita emissions from 2010 through 2019, the System's emissions have decreased by approximately 2% from the baseline each year. Please refer to the UN Target Setting Calculation Sheet, available on the MS Teams Greening the Blue Community Space, to estimate 2010 baseline emissions using this method. Should the link not work please contact the SUN team.

Example: If entity A considers 2017 to be its first year of reliable data, it will assume that from 2010 to 2017, emissions decreased ~2% from the baseline each year in line with the UN System. The entity will use the Target Setting Calculation Sheet linked above to determine the resulting 2010 baseline emissions.

This method includes the significant assumption that an individual entity reduced its emissions in line with the overall system prior to having its own data. However, this method uses the best available data to estimate a baseline for entities that do not have their own sufficient data to extrapolate 2010 emissions and that do not wish to use the conservative assumption prescribed in Method 1. The methodology used here under Method 3 is similar to the methodology used by SBTi to back calculate baseline emissions for individual companies within an industry.

For all calculation methods, entities should take into consideration the effects of any data anomalies in their estimate. Entities should also be transparent in the method and data used to estimate their 2010 baseline emissions. Once the estimated 2010 baseline is established, it can be used to set targets.

BOUNDARY SETTING

UN entities differ in their organisational make up, operations and impacts. To define boundaries for UN entities, the UN System follows the principles of the Greenhouse Gas Protocol adapted to suit the specific needs of UN entities. This uses two primary means of establishing boundaries: financial control & operational control. The key is to set and consistently maintain an organisation's boundaries as it reports so that year on year, apples can be compared to apples. **The October 2007 decision of the CEB limits the boundary of the UN greenhouse gas inventory to emissions from facility operations and travel that can be influenced by management-level decisions (although it is open to each entity to go further and voluntarily report on its wider impact).**

There is significant debate between various standard setters, and boundary setting may evolve in the future[3]. An issue that may affect UN entities in the future would be if GHG boundary setting became more aligned with an issue like Human Rights, where the concept of significant influence[4] is used. While such changes may be far off for the moment, some UN entities may wish to analyse their inventories and identify significant GHG emissions in close partners and programmes to seek more comprehensive approaches to emissions reductions rather than adhering to a strict interpretation of current UN boundaries. Again, as the UN System has committed to a leadership role, stakeholder expectations are to be considered. Assessing the possible future inclusion of programmes in the UN's scope of tracked and targeted GHG emissions is part of taking the lead in the challenging area of boundary setting and inventories.

3 For a flavour of this ongoing area of development, the following might be of interest: https://www.cdsb.net/what-we-do/reporting-guidance/boundary-setting-mainstream-reports
4 The Office of the High Commissioner for Human Rights (UN Human Rights), A Guide for Integrating Human Rights into Business Management, https://www.ohchr.org/Documents/Publications/GuideHRBusinessen.pdf

EMISSIONS SCENARIO

The studies that contribute to the IPCC report assess the totality of historical emissions, plus projected emissions based on various economic models and climate science, to determine what volume of emissions equates to which average level of global warming. These are called 'scenarios'. In 2018, the IPCC released the "Special Report on Global Warming of 1.5ºC approved by governments". This report strongly recommends aiming for a scenario of not more than 1.5ºC warming. This recommendation underpins the approved Strategy for Sustainability Management in the UN System 2020-2030 and as such, the 1.5ºC warming scenario is the one that UN entities should align their targets with.

GUIDELINE

THE UN SYSTEM COMMITS TO THE 1.5ºC WARMING SCENARIO.

TARGET DATE

The IPCC "Special Report on Global Warming of 1.5ºC approved by governments" highlights the need to reach 'net-zero' emissions by 2050. Working backwards from the 2050 date, it is possible to extrapolate reductions that would necessarily be achieved in 2040, 2030 and so on. The report further highlights that **to achieve 'net-zero' by 2050, emissions would need to be reduced between 2010 and 2030 by approximately 45%.** It is open to UN entities to set alternative target dates following the above logic, however it makes sense for the whole of the UN System to have a common year to aim for when communicating its efforts. Since executives from UN System entities committed to the Strategy for Sustainability Management in the UN System 2020-2030, focusing on sustainability improvements over the next 10 years, SUN recommends setting an initial target date within that time frame.

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THE TARGET YEAR FOR THE UN SYSTEM SHOULD BE 2030

TARGET TYPE

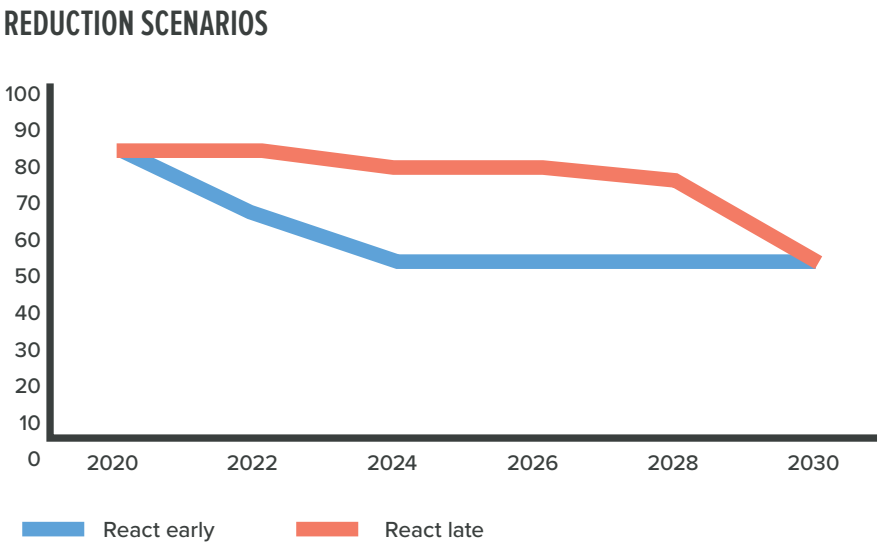
There are several types of science-based targets that can be set. Examples are:

Intensity targets - These targets specify emissions reductions relative to a particular indicator or activity such as economic output, i.e. tons CO_2eq/unit GDP. The UN System currently measures emissions intensity per capita, CO_2eq/capita, which can be used to set an intensity target. Intensity targets take into account variations in the size of UN activities and demonstrate how overall performance is improving. They show efficiency, but it is worth noting that even if an organisation grows its emissions slowly while increasing activity rapidly, there will still be an increase in actual emissions.

Absolute targets - These refer to the total quantity of GHG being emitted by an entity. Absolute targets are agnostic to the performance of an entity. If an entity shuts down half of its operations, its emissions may decrease by half in absolute terms. As such, absolute targets are a relatively rough tool to use. However, it is key to understand that the IPCC 1.5°C warming scenario requires absolute reductions of 45% between 2010 and 2030.

Hybrid targets - Combining elements of the above, a hybrid or combined target might assist in assuring robust climate action. For instance, the UN Secretariat's Climate Action Plan has a hybrid target of absolute and per capita reductions of 25% by 2025 and 45% by 2030[5].

Cumulative targets - Cumulative targets refer to total emissions over the entire reference period (2010-2030). These targets help address historical emissions - an organisation that was a high emitter between 2010 and 2020 may wish to 'make amends' for its high historical emissions in addition to reaching a % reduction target by setting a cumulative emissions target. Cumulative targets can also encourage entities to act early in reducing emissions with steady and continuous improvement instead of reacting late (close to 2030). Please see the illustration below for visualization of cumulative emissions from the react early vs react late scenarios:



YEAR	REACT EARLY (tCO_2e)	REACT LATE (tCO_2e)
2020	90	90
2022	70	90
2024	55	85
2026	55	85
2028	55	80
2030	55	55
TOTAL:	**380**	**485**

Figure 1: Two reduction scenarios vs. a 45% reduction target. Note that despite both scenarios starting out and finishing on the same tCO_2e, the cumulative emissions of the React Late scenario are over 100 tCO_2e greater than the React Early scenario.

RECOMMENDATION

UN SYSTEM ENTITIES SHOULD SET BOTH ABSOLUTE AND INTENSITY TARGETS WHILE REMAINING COGNISANT OF CUMULATIVE EMISSIONS.

5 https://www.un.org/management/sites/www.un.org.management/files/united-nations-secretariat-climate-action-plan.pdf

GAP TO TARGET

If the baseline year is 2010, and the target is a 45% reduction by 2030, then the 'gap to target' is 45%, or an average reduction of 2.25% per year. This gap needs to be recalculated annually to take effective action. If an entity has been falling below 2.25% reductions from 2010-2020, they will need much steeper reductions from 2020-2030. For example, Entity 'A' has reduced emissions steadily at 1% (of baseline)/year from 2010 to 2020. This is a total reduction of 10%, and the gap to target in 2020 is 35%. Entity 'A' will need to significantly increase its climate action to achieve 3.5% (of baseline) reductions/year until 2030. If it delays action, then the annual percentage reduction requirement increases.

RECOMMENDATION

THE GAP TO TARGET NEEDS TO BE RECALCULATED ANNUALLY.

CONSIDERATIONS ONCE THE SBT IS SET

Scenario planning/selection & costing
Once the ultimate target is set, (and the gap to target is identified), there are a number of possible scenarios that have implications for climate action. These are:

React early scenario - lower cumulative emissions, possible higher cost of investment and difficulty in implementation

Steady reduction scenario - smooth reduction trajectory, steady predictable reductions and costs

React late scenario - 'kicking the can down the road', risk of high costs at the end of reference period, risk of running out of time in case of unforeseen events (such as Covid-19), higher cumulative emissions

REDUCTION SCENARIOS

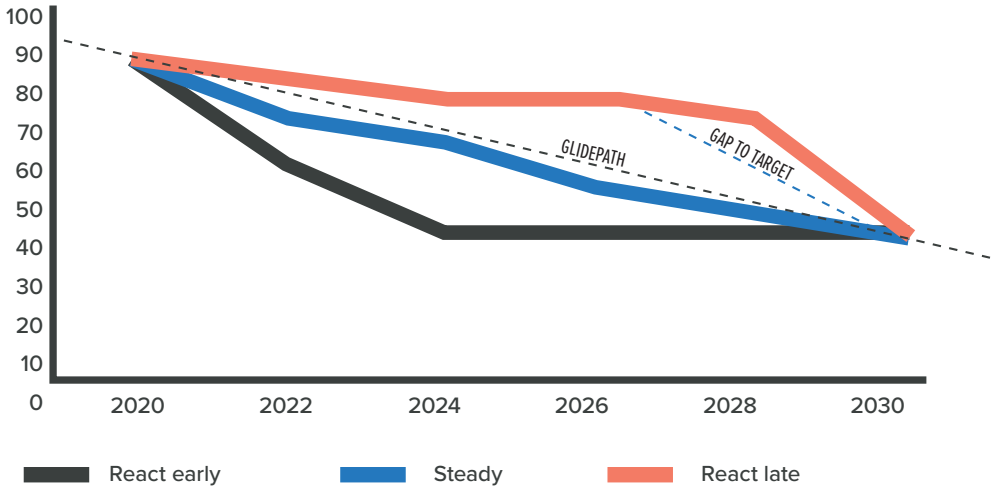


Figure 2: In the graph above three key reduction scenarios are shown vs a 45% reduction target. The glidepath, representing equivalent reductions each year, is shown alongside the three scenarios and an example gap to target for 2026.

GLIDEPATH

The glidepath in Figure 2 above is a useful concept to track progress towards targets and identify divergence. Tracking above the glidepath will leave a steeper gap to target in the future, as per the example above. Tracking under the glidepath with aggressive climate action reduces cumulative emissions for the whole of the reference period.

RECOMMENDATION

THE UN SYSTEM SHOULD, AT A MINIMUM, PLAN FOR A STEADY REDUCTION SCENARIO AND AIM FOR A REACT EARLY SCENARIO WHERE PRACTICABLE.

INTERIM TARGETS

The glidepath above also allows the setting of interim targets. Interim targets are useful particularly in cases where there is a significant divergence from the glidepath and a correction is needed to get 'back on target'. On the other hand, interim targets may act as a deterrent to immediate action and may be less effective than annual, average reduction goals per the glidepath.

For example, the UN Secretariat and UNDP have set an interim target for the year 2025.

TARGET BREAKDOWN

Once a target is set, interim targets are chosen and glidepath is understood, then it will be possible to look internally at an entity's inventory and break down the target by emissions source. For example, if entity 'A' has 100 tCO_2e of emissions, 50 tCO_2e of which is generated by air travel, and 'A' needs to achieve a 30% (30 tCO_2e) reduction overall by 2025, it may not be possible within that timeframe to reduce flights enough to achieve a 30% reduction given the current nature of operations and technology etc. If flights can only be reduced by 10% (5tCO_2e), then the rest of 'A' will have to make up the difference (25 tCO_2e). This is equivalent to a 50% reduction target for the rest of entity 'A' by 2025.

A key consideration in the above scenario is that although it may seem somewhat unfair to the rest of 'A' to achieve such steep reductions, the reality might be that some emissions such as air travel may be unavoidable in the time available.

On the other hand, if emissions from air travel are a very significant source of emissions, for example over 50%, it may not be possible for the rest of the entity to make up the shortfall. Also, the question of *materiality* arises, and it would be questionable why an entity would not be tackling its main, material source of emissions.

Each UN entity will have a specific internal situation in terms of target breakdown. The SUN team is available for ongoing advice and support.

BURDEN SHARING AND DIFFERENTIATED RESPONSIBILITY IN THE UN SYSTEM

The UN system is made up of multiple types of entities of various sizes, operations and GHG emissions profiles. The adopted approach of the UN System is that each entity is responsible for its own emissions and that each entity is responsible for setting and reaching targets. As such, there is no provision for burden sharing between UN entities (e.g. for some entities to make deeper emissions cuts to accommodate those entities who find it more difficult to cut emissions). However, it is possible within an entity to look at differentiating responsibility among different operations and activities. Hence, an entity can set a target for its overall emissions but divide up responsibility between, for example, air travel, ground travel and facilities, based on a formula that is best suited to the entity organisation typology.

FUTURE CONSIDERATIONS

Validating, communicating and reporting on targets
Entities can choose to externally validate their targets with assurance & auditing firms or speciality consulting firms. However, there is no requirement to do so, and because many firms that specialize in this area focus on private industry, it may be challenging to apply their standards in the UN System context. For example, the SBTi shared with the SUN team that their methodology is not applicable to UN entities, except for the international financial institutions (IFIs).

RECOMMENDATION

IF IN DOUBT, CONTACT THE SUN TEAM TO DISCUSS SETTING GHG REDUCTION TARGETS.

Communicating targets, and progress towards them, to stakeholders is a key lever in achieving momentum and buy-in internally and externally. As such, it is anticipated that the Greening the Blue report will start covering in the upcoming years the progress that entities have achieved against their set targets.

FUTURE PROOFING TARGETS

As the science evolves, there is a risk of future climate predictions requiring even more significant cuts to emissions. It is important, therefore, that an element of **annual review and flexibility** is built into targets should ultimate global targets change. Other factors that may require flexibility in target setting are: if an entity's boundaries change (such as including a subsidiary or partner entity in future inventories), if there are significant events that effect emissions (such as the Covid-19 pandemic), if there are significant data errors found in baseline data, etc.

It is important to note, as the UN System has committed to be a leader in this field, that stakeholders will expect targets within the UN System to be ambitious, to incorporate the 'precautionary principle' and to not be minimalist, reductionist or subject to significant doubt. The onus is on UN System entities to ensure that stakeholders have high confidence in their actions and targets.

CONCLUSION

Setting and achieving science-based targets will be an ongoing challenge for the UN System. While facing this challenge it is worth remembering the words of the UN Secretary-General who highlighted at the September 2019 UN Climate Summit that the UN System is "walking the talk" on environmental sustainability and climate change.

The following table summarises the key conclusions of this document:

The UN System commits to showing leadership and setting credible science-based targets
The IPCC advocates for a limitation of global warming to 1.5°C.
The UN System commits to the 1.5°C warming scenario, which requires an absolute 45% GHG reduction from 2010 to 2030. The baseline year is 2010 and the target year is 2030.
UN System entities should set absolute and intensity targets while remaining cognisant of cumulative emissions
The gap to target needs to be recalculated annually.
The UN System should, at a minimum, plan for a steady reduction scenario and aim for a react early scenario where practicable
If in doubt, contact the SUN team to discuss setting GHG reduction targets.
Entities should remain cognisant that 2030 is not the end goal; emissions need to continuously decrease post-2030
The UN system should, at a minimum, plan for a steady reduction scenario and aim for a react early scenario where practicable

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