



Climate Action Network

Non-Paper: Options for a Long-Term Mitigation Goal in the Paris Accord¹

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Climate Action Network (CAN) is the world's largest network of civil society organizations working together to promote government action to address the climate crisis, with more than 950 members in over 110 countries.

www.climatenetwork.org

All UNFCCC Parties agreed in Lima on a long-term temperature goal of limiting global average temperature rise to below 1.5°C or 2°C above pre-industrial levels.² Since then, Parties have considered the possibility of adopting a complementary long-term goal (LTG) to operationalize this temperature target. The new global climate agreement, whose adoption is anticipated in Paris this December, represents a tremendous opportunity to frame an adequate, overarching global goal for the decades to come, yet it also comes with risks in this regard.

It is therefore timely for CAN to summarize the debate surrounding the appropriate LTG to emerge from COP21 in Paris. Although negotiators are also considering including in the Paris outcome LTGs for adaptation, loss and damage, and finance, this discussion paper limits itself to providing an overview and explanation of the **mitigation** LTGs referred to in the Geneva Text, as well as of the mitigation goals that have been prominently articulated by civil society. The paper aims to inform negotiators and civil society actors by clarifying different options currently in the text and by presenting a discussion on what the ultimate objective of the new Paris Agreement could be.

The core equation for any LTG is as follows:

Gases to be reduced + **Amount** they are to be reduced by + **Date** by which to achieve the target + **Guidance** on how to share the effort between actors = **LTG**.

¹ This document has the status of a Non-paper and is designed to stimulate discussion on several options of a long-term mitigation goal. This paper does not represent the official position of Climate Action Network. You can find the official CAN position here: <http://www.climatenetwork.org/publication/can-position-long-term-global-goals-2050-june-2014>

² UNFCCC, 2014: Decision 1/CP.20 The Lima Call for Climate Action: https://unfccc.int/files/meetings/lima_dec_2014/application/pdf/auv_cop20_lima_call_for_climate_action.pdf

These four factors—further elucidated in this paper—are critical to shaping the ambition and equity of the goal and to shaping how a LTG can support near-term action and what meeting that goal would mean for the planet and the prospects for sustainable development. Some parties are more likely to prefer a LTG without a specific quantification of the emissions to be reduced, or a quantified reduction without a specific date to achieve the target by (e.g. "full decarbonization by the end of the century"). Some parties are likely to prefer relatively explicit guidance on how to share the effort required between countries.

As such, the mitigation goals contained within the Geneva Text demonstrate varying levels of ambition and time frames, and varying considerations of equity within these categories. An overview follows.

Proposed Mitigation Goals from the Geneva Text

- Temperature goals of no more than 1.5°C or 2°C global average temperature rise
- 40-70% GHG reductions from 2010 levels by 2050
- 70-95% GHG reductions below 2010 levels in 2050, negative emissions thereafter or zero emissions by 2060-2080
- 50% GHG reductions by 2050, based on 1990 levels
- Decarbonization by 2050 and/or negative emissions by 2100
- Net-zero emissions by 2050, with a peak in 2015
- Carbon Neutrality/zero-net/net zero emissions by 2050
- Full decarbonization by 2050 for developed countries and a sustainable development pathway for developing countries consistent with a peaking of global GHGs as soon as possible
- Net emissions to zero by 2050, with a 2015 peak for developed countries and a later peak for developing countries
- Carbon budget divided among parties in accordance with historical responsibilities, ecological footprint, capabilities and development
- Near-zero gigatonnes CO₂ equivalent or below by 2100
- Stabilization of the concentration of GHGs in the atmosphere at or below 350 ppm of CO₂ equivalent
- A long-term zero-emission sustainable development pathway.

This non-paper provides more information on the different **types** of mitigation LTG that have been floated; discusses **equity, ambition and timeframes in the goals**; and clarifies a number of **definitional issues**.

Types of Goals

Multiple mitigation LTGs have been proposed as part of the Geneva Text. These can broadly be divided into the following three categories:

- Goals focused on **temperature change**;
- Goals addressing the **level of carbon dioxide in the atmosphere**;
- Goals focused on **emission cuts**.
- Goals focused on **emission budgets**.

Climate Action Network (CAN) has also put forward a fourth type goal:

- **Phasing out fossil fuel emissions and phasing in 100% renewable energy by 2050.**

These different types of LTG are further elucidated below. It is worth noting that they are not mutually exclusive, and can, and likely will, be presented together.

Temperature Goals

Throughout the Geneva Text, there are references to the goal of limiting temperature change to 2°C or 1.5°C above pre-industrial levels. This goal has roots in Article 2 of the UNFCCC:

“The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner”. (UN, 1992)

This clause has been widely conceptualized as a need to keep global temperature change below a certain level to avoid serious consequences to the climate. The Cancun Agreements refer explicitly to the importance of a long-term goal of staying below 2°C temperature rise. However, many Parties and civil society organizations and networks, including CAN, have argued, on the basis of the best available science, that 2°C of warming will result in extensive harm, and have instead put forward a goal of limiting global temperature rise to 1.5°C. It has also been suggested that setting a goal of 1.5°C will prompt more immediate action than a 2°C goal, giving the world a greater chance of reducing harm from climate change. Both goals appear throughout the Geneva Text.

Whether the goal is limiting warming to 1.5 or 2°C, it is often viewed in conjunction with other goals, rather than as a standalone measure. A goal of avoiding a temperature change does not provide a clear means of action, nor is there a clear, agreed way to measure progress towards that goal. **A clear way forward is called for, which a temperature goal alone does not necessarily provide.**

Carbon Dioxide Levels in the Atmosphere

Another LTG framing is to determine a level of carbon in the atmosphere that would avoid extensive harm, and to resolve to stabilize greenhouse gas (GHG) quantities in the atmosphere at that level. The Geneva Text contains a proposal of a goal to stabilize the concentration of GHGs in the atmosphere at below 350 ppm of CO₂ equivalent. In its examination of mitigation scenarios, the Intergovernmental Panel on Climate Change (IPCC) typically investigates how different levels of CO₂ in the atmosphere will affect climate change, and in particular, projects the likelihood of staying under a 2°C temperature increase under various scenarios of CO₂ levels. **A concentration goal gives clearer guidance on the overall level of mitigation needed, but is less clearly related to impacts than a temperature goal.**

Emission Cuts

The bulk of the mitigation goals included in the Geneva Text are quantified emission cuts or targets. These goals are the most straightforward and self-explanatory as a global goal for tackling climate change, though there are two concerns. These goals, while providing a clear metric, do not provide a clear framework of who needs to take action. To be effective, they would need to be paired with a strong equity framework. Additionally, the adequacy of the LTG and its implementation goes hand in hand with the Paris Agreement containing some kind of ambition-acceleration mechanism with regular commitment cycles, and measurement of the implementation of each Party's commitments to ensure the decarbonization is continued and commensurate with the trajectories required to avoid 1.5°C or even 2°C of temperature change. **A LTG described as emissions cuts is clear in the overall levels of mitigation required, but is less able to respond to future scientific findings on the impacts that this might incur (particularly if positive feedbacks in the climate system are activated) or the level of concentrations of GHGs in the atmosphere and thus their overall radiative forcings.**

Emission Budgets

The world's carbon budget is the total amount of carbon that can be emitted if we are to stay below a particular level of global warming. The 5th Assessment Report of the IPCC³ quantifies for the first time the global carbon budget for staying below 1.5°C or 2°C of average temperature rise above pre-industrial levels. It finds that less than 1000 GtCO₂ of CO₂ can be added to the atmosphere between 2011 and 2050. For a strong likelihood of keeping warming below 1.5°C the emissions budget is reduced to 400 – 850 GtCO₂ for the period (IPCC AR5 SYR, page 64).

A budget serves to provide constraints on both the trajectory and endpoint of emissions for a given time period. A point target (e.g. for 2050) says nothing about the pathway needed to get there and could— theoretically at least—allow huge amounts of emissions over the years to the target date, and as long as

³ IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp.

the target itself is reached, the goal would have been reached. For this reason, a carbon budget approach provides more clarity on emissions reductions needed than a 2050 (or other dated) point target. Emissions budgets also reflect the important scientific concept of cumulative emissions in a way that a point target fails to do.

Emissions budgets are also more effective at illustrating which countries are using more than their fair share of the available carbon budget. Therefore they could work well with strong equity frameworks.

CAN's proposal for the Long-Term Goal: "A Global Transition from Fossil Fuels to Renewable Energy"

CAN has put forward a LTG of eliminating the use of fossil fuels and transitioning to 100% renewable energy for all by 2050. This includes ensuring access to sustainable and affordable energy for all, not just the proliferation of renewable energy technology.

What are we looking for?

The cornerstone of the new climate agreement should consist of four key mitigation elements:

1. Ambitious near-term (2025⁴) mitigation commitments from all countries, the nature and stringency of which will vary depending on their common but differentiated responsibilities and respective capabilities (CBDRRC);
2. A near peaking date (CAN is calling for a global emissions peak by 2015);
3. A LTG for GHG emissions reductions commensurate with the science of a maximum 1.5°C of global average temperature rise, and in line with agreed principles of equity;
4. Mitigation finance commitments to enable enhanced mitigation action in developing countries beyond these countries' own ambitious near-term commitments, and in view of achieving the LTG.

Equity, Ambition and Timeframes in the Goals

Equity

Implementation of a LTG must address the question of equity. An equitable approach must not mean compromising high levels of ambition, but should ensure that principles such as CBDRRC, historical responsibilities, and the right to sustainable development are meaningfully taken into account in determining the relative efforts required of actors in achieving the LTG. **Any LTG that does not address the issue of equity is going to put the onus of mitigation on developing countries.** The present 2020 targets of developed countries and their 2030 INDCs make it very clear that their efforts currently leave

⁴ CAN sees that 5-year commitment periods are an essential part of the Paris Agreement, and should be captured as an integral part of the treaty

no possibility of a global peak year of 2020. Action to achieve the LTG must be compatible, for example, with efforts to realize the rights of 1.3 billion people who according to the IEA still lack access to electricity and the approximately 800 million who are still undernourished. **It is vital to recognize that adequate climate action will remain unachievable without taking such equity considerations into account.**

Some civil society members have called for a formal equity review process within the UNFCCC, one designed to help deliver a “fair enough” set of post-2020 contributions consistent with a very high level of common ambition. This is not currently included in the Geneva text.

Timeframes and Ambition

To help define what adequate ‘ambition’ and timelines are, the science says:

The IPCC’s AR5 found that only one scenario, RCP 2.6, offers a 66% (likely) chance of staying within 2°C. It requires that:

- All GHG emissions are reduced by 40 - 70% by 2050 (using a 2010 baseline)
- CO₂ emissions are net zero by 2075 and net negative thereafter
- All GHG emissions are zero by 2100

CAN regards this probability as unacceptably low, especially as it implies a very low probability for limiting global average temperature increases to 1.5°C.

The 2014 UNEP Emissions Gap report says that to stay within the 2°C range, “global carbon neutrality will need to be achieved sometime between 2055 and 2070” and “total global greenhouse gas emissions need to shrink to net zero sometime between 2080 and 2100.”

Climate Action Tracker, the Potsdam Institute, Ecofys and Climate Analytics have found that:

- For a high probability, i.e. 85% chance or more, of achieving 2°C, and 50% chance of achieving 1.5°C, CO₂ emissions from fossil fuels combustion must be completely phased out between 2045 and 2065;
- All global GHG emissions must peak in 2020 and be phased out to zero between 2060 and 2080, becoming net negative thereafter.

The longer global decarbonization is delayed, the higher the risk of overshooting 1.5°C or 2°C. Emissions cumulatively contribute to climate change and at some point our natural carbon sinks (soil, oceans, forests etc.) will become saturated, turning from sinks to sources of emissions. This means deep and short-term action to reduce fossil emissions is essential, starting today.

Therefore the essential component of the LTG in terms of its level of ambition is the amount of emissions “under the curve” - an emissions budget. This means a LTG should ideally contain more detail than simply “zero by 2050”. It could specify, for example, peaking in 2020, and then full phase-out of

emissions from fossil fuels by 2040 and phase in of 100% renewable energy, then full decarbonization by 2050, reaching zero emissions from 2050 onward. This puts the bulk of the required decarbonization efforts under the curve near the beginning of the timeline, giving the highest likelihood of a maximum of 1.5°C or 2°C temperature rise. The same goal with a timeframe of 2100 instead of 2050 would have drastically different implications for the planet. Meeting goals in a shorter timeframe provides much-needed ambition.

Generally, civil society agrees that goals with timeframes that run towards the end of the century are not sufficiently ambitious as they fail to prompt needed action in the near-term, and are incompatible with either the 1.5°C goal, or even the 2°C goal; with adequate probability. The most common time frames that have been put forward are meeting emission cut goals by either 2050 or 2100. Some goals are multistep, comprising an initial goal from 2050 (or sometimes sooner) and a more ambitious goal for later in the century. Language has also been suggested for around when emissions should peak, which either identifies specific time frames (such as a peak by 2015, which is CAN's position) or uses more vague wording, such as "as soon as possible."

Definitional issues

Net-Zero/Zero Net Emissions

"Net-zero" remains undefined by most Parties. Some interpret net zero and zero emissions to mean the same thing, especially as net-zero has not been adequately defined in the Geneva Text. Net-zero allows for emissions as long as sinks or carbon removal technologies remove as much or more carbon from the atmosphere. This "net-zero" is achieved only by balancing emissions with negative emissions. Net-zero on its own does not require, promote or assume specific technologies or particular amounts of negative emissions. Therefore an accurate use of the term should specify the gases included, the sector(s) covered, and the amounts of assumed negative emissions.

Many civil society organizations have criticized net-zero as it allows for an overshoot strategy, where countries can continue emitting carbon, overshooting the carbon budget, and then relying on carbon removal technologies to bring the carbon level down. They are concerned this goal would not provide the needed ambition, as it would offer an excuse to avoid immediate action and that positive feedback loops in the climate system may be activated. Carbon removal technology is also unproven, particularly at this scale, and forests and other biological sinks may become sources of emissions above certain temperature thresholds. Critics have raised major concerns, as a net-zero goal could rely on bio-energy with carbon capture and storage (BECCS) and could lead to large-scale land grabs. Many IPCC scenarios assume between 0.5 and 6 billion hectares of land to provide biomass for BECCS in their scenarios to keep planetary temperature rise to under 2°C. This would imply a serious threat to biodiversity, land rights and global food production, which currently uses 1.5 billion hectares for crop production. A recent

report⁵ also noted that geoengineering solutions will not save the oceans from severe climate impacts related to sea level rise, pH, temperature and levels of dissolved oxygen.

Some believe that the net-zero goal can be supported if it is clearly defined and restricted in the manner outlined below: Only in the case where the amount of the remaining gases is minimal, no alternatives to the emitting technologies are available, the use of these technologies is regarded as essential, and removal of these gases from the atmosphere can be determined and ensured in a transparent, sustainable, equitable and socially-responsible way, can we consider accounting towards net zero through some specific, sustainable removal approaches. The use of the removal approaches must not compromise rapid fossil and industrial emission reductions, or environmental integrity. Also, if considered, the global emissions of GHGs must be reduced to the maximum extent possible, as quickly as possible, through the reduction of fossil and industrial emissions. In addition to reducing fossil emissions as quickly as possible, emissions from biological sources need to be addressed, as well as carbon stores that have been destroyed.

Others argue that because of the ambiguity, different interpretations and risks associated with the language, “net-zero” should not be used. They therefore argue for the use of the term “zero” or “near-zero” instead.

Carbon Neutrality/Climate Neutrality

Carbon neutrality means achieving net-zero CO₂ by balancing any carbon released with an equivalent amount captured through net negative processes, either locally or elsewhere. *Climate neutrality* is the same, but includes all gases. The same issues and risks outlined above for “net-zero” also apply here.

Zero Emissions

Some CSOs may see zero emissions as literally meaning zero emissions, as a clear rallying call to the level of mitigation effort needed. Others use “zero emissions” as shorthand to imply major decarbonization, while recognizing that there will always be a small residual of emissions—which may or may not require minor negative emissions approaches. (This is similar to the meaning of “near-zero”.)

However, other organizations interpret “zero emissions” to have a very similar meaning to “net-zero” (i.e. the use of negative emissions technologies to balance out GHG emissions to reach zero), and implying an undefined and potentially large amount of negative emissions, and potentially similar risks as associated with “net-zero” language.

In this way “zero emissions” can be perceived to spur short-term action, as reduction of emissions released into the atmosphere is emphasized as the largest part of the effort to reduce emissions.

⁵ Mathesius, Hofmann, Calderira, Schnellhuber, 2015, Nature Climate Change, 3 August.

Near-Zero Emissions

Near-zero emissions is a mitigation goal requiring almost complete decarbonization, but that recognizes that there is likely to be an irreducible minimum of emissions from agriculture, some industrial processes and a small amount of aviation. After achieving near-zero emissions, some groups believe that some negative emissions processes will then be required to absorb the remainder.

Decarbonization

Decarbonization has different meanings depending on the context and there does not seem to be a dominant usage in the negotiations so far. Decarbonization can be used to refer to an energy transition from carbon intensive sources, such as coal, to energy sources that do not create carbon emissions such as solar or wind energy, and which could also imply nuclear. However, decarbonization can also mean reducing the carbon intensity in the atmosphere or simply reaching zero carbon emissions. If decarbonization is included in the LTG, it should be clearly defined. In any case, the decarbonization definition only includes those gases containing carbon, leaving others, such as NO_x, out of the action.

CONCLUSION/ RECOMMENDATION REGARDING DEFINITIONS:

The various terminologies are used by organizations, countries and scientists in different ways. If CAN were to take a particular term such as “net-zero” or “zero emissions” to have a specific meaning, there would be no guarantee that others would interpret and apply the term in the same way.

The terms “zero emissions” and “near-zero” are broadly thought to incentivize greater ambition and imply fewer risks to land grabs and food security. However they are not entirely risk-free.

Therefore, it is advisable to be as specific as possible in applying the terms, to indicate an emphasis on immediate reduction of actual emissions released into the atmosphere, and a clearly defined approach that limits the size/scale of the negative emissions and specifies that any solutions used would be limited to particular approaches such as restoring degraded ecosystems.

It should be noted that CAN’s formulation of the LTG—**phasing out fossil fuel emissions and phasing in 100% renewable energy by 2050**—avoids these definitional pitfalls, but does not take into account the emissions from the biosphere that also need to be addressed to remain within carbon budgets consistent with 1.5°C.