A LONG-TERM GLOBAL GOAL

That Delivers Equity And Ambition, And Why "Net-Zero" Cannot Play A Role

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*In the new climate agreement being negotiated for Paris in December 2015, Parties are discussing a **long-term global goal** on climate change, and how to achieve this.*

A 1.5°C increase in global average temperatures over pre-industrial levels is considered the threshold between dangerous and very dangerous climate change by many scientists, social movements, and over 100 governments. If we are to keep as far below a 1.5°C increase as possible, we must stick to a very strict emissions budget and avoid "overshooting" to higher temperatures, or we will risk crossing dangerous climate tipping points.

The seriousness of the climate challenge means that emissions of CO_2, the main greenhouse gas (GHG), must be reduced to zero by 2050 at the very latest, with developed countries reaching this target far earlier, due to their historically higher levels of emissions. All other GHG emissions must go essentially to zero well before the end of this century to avoid the most dangerous climate impacts.

The question for setting a long-term global goal then, is how best to define and incentivise this very ambitious emission reduction pathway in an equitable manner.

Radical emissions reductions must begin immediately, with developed countries taking the lead, including on the provision of support (finance, technology, and capacity-building) for mitigation in developing countries – otherwise the accumulating emissions will exhaust the finite carbon budget in only a few decades. Achieving these reductions will require a major global transition – including a transition to 100% renewable energy. However, this transition must also be just and equitable for the most vulnerable and impacted people, providing a low-carbon sustainable development pathway for developing countries.

In the negotiations, a variety of terms are used to describe the pathways for climate mitigation action, such as "full decarbonisation," "baseline percentage reductions" and "near-zero", or "zero emissions." However, several more ambiguous and potentially dangerous terms are also used, including "net-zero", and carbon or climate "neutrality": these latter terms fail to define a pathway for emission reductions that is equitable or ambitious, and must be rejected as a long-term goal.

The problems with "net zero"

"Net-zero," also at times referred to as "zero net emissions," or "climate/carbon neutrality," requires that the sum total of emissions and removals reach zero. This approach does not define an emission reduction pathway, and does not necessitate the complete transition away from fossil fuel.

This is because any amount of "net" or "negative" emissions could be used to offset on-going emissions from fossil fuels. As such, these terms do not put a limit on the overall amount of greenhouse gases being emitted, but assume that land-based sequestration and unproven, uncertain and risky technologies such as Bioenergy Carbon Capture and Storage (BECCS) will remove these emissions in the future. This approach enables the hiding of very weak ambition in the near term and dangerous "overshooting". It could allow continued emissions from fossil fuels regardless of whether promised removals later in the century do occur, which will trigger dangerous tipping points if emissions continue beyond the remaining carbon budget set out by the IPCC.

The notion of negative or net-zero emissions also poses enormous risks for food security, water supply, land rights and biodiversity that need to be understood. Achieving negative emissions on a scale meaningful to climate change mitigation will require huge amounts of land to store carbon and/or produce crops for bioenergy, with scenarios suggesting hundreds of million – or even billions – of hectares required. That demand for land would seriously threaten food security and land rights.

The problems with assuming that large amounts of land-based sequestration can offset on-going emissions from fossil fuels are multi-fold:

1. It likely will not work: The sequestered carbon does not stay in trees and soils forever, and is therefore not permanent. A warming atmosphere, among other things, can increase the rate that this terrestrial carbon is released (as CO2), increasing total emissions to the atmosphere.

2. Expectations for future technology might not be feasible: A key example of negative emissions technologies is bioenergy with Carbon Capture and Storage (BECCS) which relies on bioenergy plantations to draw carbon out of the atmosphere and store it underground in geological storage (while also generating energy). BECCS is an unproven, uncertain and highly risky technology. There is a risk that CO_2 stored underground will leak, with serious implications on health and local ecosystems. To assume questionable technologies that are not even operational as a major part of a future climate action is illogical and hugely irresponsible.

3. Land grabs: Research estimates that between 500 million and up to 6 billion hectares of land would be required to grow trees and other biomass for BECCS, depending on the scale of reductions proposed. Historically land grabs in developing countries have heavily impacted on 'marginal lands' - those used as the livelihoods and homes for small-scale farmers, women, indigenous peoples and pastoralists. It is the world's most marginalised communities that are most likely to suffer first if land is grabbed for 'negative emissions.

4. Impacts on food production: Current total crop production uses just 1.5 billion hectares of land globally. To devote even a fraction of arable land to climate mitigation, when yields are already under huge pressure from climate impacts, would place serious pressure on food systems, food prices and food security.

5. Impacts on biodiversity: Using land for bioenergy crops or industrial scale forest plantations will have significant impacts on biodiversity, as well as other environmental problems such as increased water run-off, fertilizer use and water demands.

6. Opens the door for even riskier geo-engineering: If an ambiguous 'net-zero' long-term goal is agreed and justifies continued fossil fuel emissions, instead of real emission reductions, this could set the world on course towards even more dangerous geo-engineering technologies. If the hoped-for negative emissions are not realised, due to the unfeasibility of large-scale land-based mitigation or BECCS technology, the world will face even higher temperature rises and desperate measures. In this scenario, demands will increase for geo-engineering technologies such as 'solar radiation management,' which most actors today agree are unjustifiably risky and dangerous technologies.

The way forward

Overshooting the emissions budget while relying on risky or non-existent negative emissions technologies are unacceptable risks. Net-zero, which does not define the size of the net or provide a fair shares framework for sharing the burden on climate action, puts land and food rights at risk, and must be rejected as a long-term goal.

Instead, a long-term global goal in the Paris agreement should call for full decarbonisation globally by 2050, and require developed countries to take the lead with a short-term goal for full decarbonisation by 2030. Such a goal would and should drive immediate, ambitious and equitable climate action, and will require the provision of significant amounts of finance and technology transfer to developing countries, to enable them to transition to a low carbon sustainable development pathway.

Are there good negative emissions?

To compensate for emissions that we cannot avoid – such as some emissions necessary for food production – and to lessen the risks of crossing catastrophic tipping points, some level of emissions will need to be drawn out of the atmosphere. However, we do not need to resort to dangerous and unproven geo-engineering to do this. The best way to accomplish negative emissions safely is through the restoration of degraded natural ecosystems – enhancing our natural sinks.

Degraded natural ecosystems – such as forests and peatland, have the highest potential for restoring biodiversity and storing carbon. Hence halting deforestation and forest degradation by 2020, restoring drained peatlands, and allowing these ecosystems to recover to full sink capacity in ways that maintains and maximizes biodiversity, represents a significant source of both avoided emissions (stopping GHG emissions from forest loss and from degraded peatlands) and negative emissions (regeneration of degraded ecosystems sequesters carbon). Together with rapid phase out of fossil fuel emissions by 2050, these efforts add to our chance of limiting temperature rise to 1.5°C.

Although the planet's forests and natural ecosystems provide an essential sink for our planet's pressured carbon cycle, "negative emission" assumptions must be treated carefully, and "net-zero" language avoided. While the protection and restoration of natural ecosystems is part of a pathway for keeping global temperature rises to under 1.5°C, these actions must take place on top of, and in addition to immediate and ambitious action in the industrial and energy sectors.

Radical emissions reductions must begin immediately, with developed countries taking the lead, including on the provision of support for mitigation in developing countries – otherwise the accumulating emissions will exhaust the carbon budget in only a few decades. Achieving these reductions will require a major global transition – including a transition to 100% renewable energy. However, this transition must be just and equitable for the most vulnerable and impacted people, providing a low-carbon sustainable development pathway for developing countries.

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