



A child standing on parched land in Afghanistan's remote district of Saia Murgab, where climate change is proving a deadlier foe than the country's recent conflicts. Depending on future socio-economic conditions, a rise of 2 deg C in global warming will see more than 61 million people exposed to severe drought and other types of water shortages, the writers say. Keeping to 1.5 deg C will mean that up to half the world's population will be spared climate-induced water stress. PHOTO: AGENCE FRANCE-PRESSE

# COP26: Why we must do all we can to meet the 1.5 deg C target

Pledges at the Glasgow meet fell far short of the goal set in the Paris Agreement. While the figure may seem small, failing to cap global warming at the 2015 target will have a devastating impact on billions of people and entire ecosystems.

**Benjamin P. Horton and Lauriane Chardot**

For The Straits Times

In 2015, the landmark Paris Agreement set out a legally binding international treaty on climate change. The agreement sets out a global framework to avoid dangerous climate change by limiting global warming to well below 2 deg C and pursuing efforts to limit it to 1.5 deg C. The agreement also aims to strengthen countries' ability to deal with the impacts of climate change and support them in their efforts.

At COP26, governments had to make progress in closing three major gaps: a gap in targets to reduce emissions, a gap in rules to deliver and monitor progress, and a gap in financing the climate action needed to put the world on a pathway to a safer future.

At COP26, we expected leaders to agree to a step change in the pace and scale of climate action. But based on the targets submitted by nations at the recently concluded conference in Glasgow, the world is now on track to warm 2.4 deg C since pre-industrial times by the end of this century. That is a far cry from the 2015 Paris climate deal's overarching limit of 1.5 deg C or even its fallback limit of 2 deg C. This shortfall was recognised in the final agreed COP26 document with its inclusion of a pledge that revised (and more ambitious) plans for cutting emissions are to

be submitted by each nation in a year's time.

So, why do we need to cap the rise at 1.5 deg C? Why is half a degree so important?

## EXTREME HEAT AHEAD

An increase of 1.5 deg C means temperatures on land could rise by 3 deg C to 4.5 deg C in central and eastern North America, Central and Southern Europe, as well as Asia. Exceptionally hot days will become the norm, and extreme heatwaves are projected to affect around 14 per cent of the earth's population. At a 2 deg C increase, that figure rises to 37 per cent with one billion people enduring extreme heat stress.

## WATER SHORTAGES

A 1.5 deg C increase is projected to impact the availability of water in Southern Europe, North and Southern Africa, and Australia. Depending on future socio-economic conditions, a rise of 2 deg C will see more than 61 million people exposed to severe drought and other types of water shortages. If we do keep 1.5 deg C alive, it means that up to half the world's population will be spared climate-induced water stress.

## FLOODING

A 1.5 deg C increase will spare many regions from experiencing extreme rainfall. At 2 deg C, Northern Europe and mountainous regions in Northern America will be prone to flood risks, and high-latitude countries such as Iceland, Greenland and Alaska will also be affected by extreme precipitation.

At 2 deg C, "unheard-of" storms become more common. An event that occurred once every 50 years in the past will happen three times per decade.

## BIODIVERSITY AND ECOSYSTEMS

A 1.5 deg C warmer world is unkind to flora and fauna: 8 per cent of plants, 6 per cent of insects, and 4 per cent of vertebrates will be

drastically affected by a 50 per cent reduction in viable geographic range.

At 2 deg C, the percentage of flora and fauna affected more than doubles. Forest fires are also predicted to destroy large areas of the Amazon, an area that is critical for the world's biodiversity and carbon storage. The Amazon rainforest is home to over 40,000 types of plants, and 2.5 million species of insects.

## SEA ICE AND SEA-LEVEL RISE

A 1.5 deg C increase is projected to cause an ice-free Arctic summer once every 100 years. Alarmingly, that becomes an ice-free summer every 10 years at 2 deg C. Capping global warming at 1.5 deg C will also halve the amount of melting ice that causes sea levels to rise, but an increase of 2 deg C could cause the irreversible loss of the Greenland ice sheet and collapse of the Antarctic ice sheet, leading to a 5m sea level rise by 2150.

This will have compounding effects on the delicate ecosystem – as large amounts of the sheet melt, the ice drops to lower, warmer levels, further accelerating melting. Fresh water from melting ice will also impact ocean saline levels, slowing down the vital Atlantic Ocean Circulation System and further accelerating the breakdown of Arctic ice.

## MARINE LIFE

The ocean absorbs vast quantities of heat from greenhouse gases, sequestering around a third of the world's carbon dioxide (CO<sub>2</sub>). Increased absorption means rising ocean temperatures and acidification, with associated risks for a range of marine life that includes coral, algae and fish.

There is substantial evidence that even an increase of 1.5 deg C will cause a 70 per cent decline in coral reef viability. At 2 deg C, coral reefs face almost complete die-off, with the loss of 99 per cent of the reefs worldwide.

## WHAT ABOUT SOUTH-EAST ASIA?

Climate change could cut over 35 per cent of the Asian region's gross domestic product by the middle of the century as it can severely impact key sectors such as agriculture, tourism and fishing along with human health and labour productivity.

South-east Asia will experience hotter weather, longer monsoon seasons and increased droughts. Recent studies estimate that up to 64 per cent of the Asian region is likely to be affected by drought.

Future sea-level rise will affect populations, economies and infrastructure of every coastal nation. In the coming decades, the greatest effects will be felt in South-east Asia, due to the number of people living in low-lying coastal areas.

Mainland China, Bangladesh, India, Vietnam, Indonesia and Thailand are home to the most

people on land projected to be exposed to average annual coastal flood levels by 2050. Together, these six nations account for 75 per cent of the 300 million people on land facing the same exposure to coastal flooding at mid-century.

## THE 'NET ZERO' CHALLENGE

The key question is, how does the world keep warming within 1.5 deg C?

All the evidence put together by the Intergovernmental Panel on Climate Change (IPCC) indicates that a target of net-zero emissions needs to be reached at the latest by mid-century. Many countries have already made net-zero commitments, such as the United States (2050), China (2060), Japan (2050) and South Korea (2050), broadly in line with the IPCC advice. COP26 requires all other nations to do the same.

But, what does "net zero" actually mean?

A net-zero target contains within it two related, but different responses to the problem of rising temperatures. The first is to stop releasing greenhouse gases in the first place, by cutting emissions. The second is to remove CO<sub>2</sub> from the atmosphere, using "negative emissions technologies" (NETs).

The IPCC has emphasised the need for negative emissions, in addition to increased efforts to cut greenhouse gas outputs, if emissions are to fall to "net zero". A net-zero target is met when these two balance – when residual emissions are offset by CO<sub>2</sub> removals.

Combining emissions reductions and negative emissions into a single target of reaching "net zero" creates a number of problems that lie in the interaction between these two. If we pay more attention to removals, this might provide a reason for delaying or even reduce future emissions cuts. If we focus only on emissions cuts, might this hamper the development of NETs?

This is our worry.

The main problem is that NETs are still only prospective technologies – they do not exist at the scale required to have any significant impact on CO<sub>2</sub> levels in the atmosphere. Many critics accuse proponents of such technologies as simply engaging in "green-washing".

Therefore, net-zero plans that rely on promises of future carbon removal – instead of reducing emissions now – are currently at best a very risky bet.

If the technologies anticipated to remove huge quantities of carbon fail to work as expected – or even lead to rebounds in emissions from land-use change, for example – then net zero will not be achieved.

So-called "nature-based solutions", which rely on plants in restored forests and marine environments absorbing more CO<sub>2</sub>, are similarly unpredictable, not least because of the effects of climate change already on these ecosystems.

A further problem lies in verification and regulation. In-built into the idea of net zero are the processes of offsetting and carbon trading. Negative emissions are traded as offsets in carbon markets, meaning that emissions get to continue elsewhere, instead of being cut.

COP26 has attempted to address this problem, but it is enormously complicated and we worry that countries and corporations will seek out loopholes that mean in practice true global net zero will not be reached.

## A DEFINING DECADE

This is a defining decade in our battle against climate change. COP26 was so important because governments have the power to enact legislation which could regulate industries to remain within sustainable emission limits and adhere to environmental protection standards. Companies should be compelled to purchase emissions rights – the profits from which can be used to aid climate-vulnerable communities.

Governments could also make renewable energy generation, from sources such as solar panels and wind turbines, affordable to all consumers through subsidies. More must also be done by rich countries and powerful industries to support and empower poorer countries to mitigate and adapt to climate change. People in poorer countries deserve solidarity and support, not a smaller share of the blame.

This requires an unprecedented level of cooperation and trust between nations.

All of this is not to say that individuals cannot or should not do what they can to change their behaviour where possible.

The most important thing every individual can do is to demand that the world's leaders do what they can to fight climate change: talk about it. Asking individuals to bear the burden of climate change shifts the responsibilities from those who are meant to protect to those who are meant to be protected. We need to hold governments to their responsibilities first and foremost.

In summary, we need to do everything in our power to cap the rise at 1.5 deg C.

stonipion@sph.com.sg

Professor Benjamin P. Horton is director of the Earth Observatory of Singapore. Lauriane Chardot is a research fellow with NTU. Some of the suggestions and findings in this commentary were drawn from "Adaptation and Resilience in ASEAN: Managing disaster risks from natural hazards", a policy paper led by NTU's Earth Observatory of Singapore and the University of Glasgow, published ahead of COP26 by the British High Commission to Singapore and the COP26 Universities Network, which comprises more than 80 universities in the UK and Singapore.