CONFERENCE OF THE PARTIES. COP CLIMATE CHALLENGES

11/25/2024

"It feels that the developed world wants the planet to burn."
Juan Carlos Monterrey,
Gomez, Panama representative COP29, Baku, Azerbaijan

INTRODUCTION

Global average temperatures across the year 2024 are on track to end up more than 1.5ºC above pre-industrial levels, which would make it the first calendar year to breach the symbolic mark. The higher temperatures are attributed to anthropogenic activities, with smaller contributions contributed by natural factors such as the El Niño weather pattern. A UN report warns that current policies place the world on track for around 3ºC warming by the end of the century,

World leaders meet every year to discuss their climate commitments, most recently at the climate summit Conference of the Parties, COP29 at Baku, Azerbaijan. The meeting proposes that developed countries donate to developing countries $300bn or about £240bn annually by 2035 in facing the challenges of Climate Change. Some attendants advocate the abandonment of fossil fuels altogether in favor of renewable sources.

Figure 1. Higher levels of CO_2 in parts per million, ppm favor plant growth in greenhouse experiments.

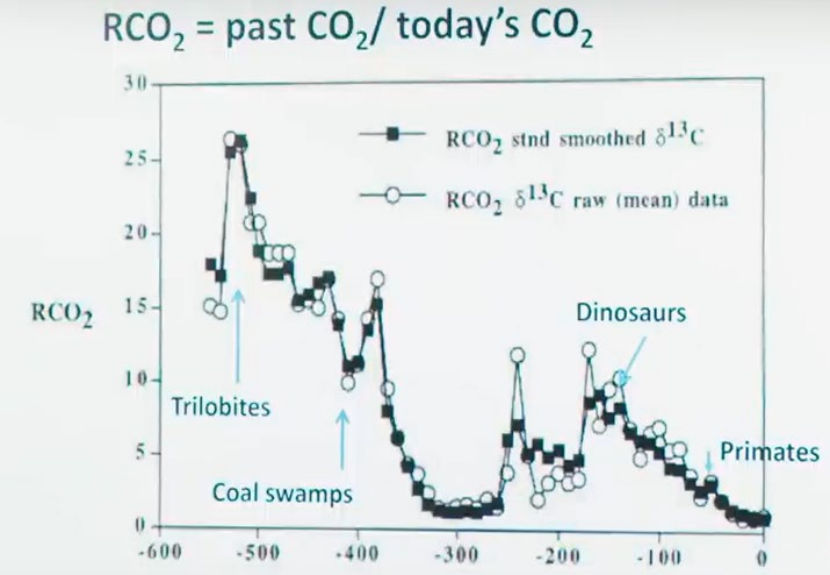

Figure 2. Past to today's CO_2 concentration ratio, R during past terrestrial life epochs.

The Earth's climate has changed naturally throughout the Earth's history. But natural causes cannot explain the particularly rapid warming seen over the last century, according to the UN's climate body, the Intergovernmental Panel on Climate Change, IPCC.

Since the start of the Industrial Revolution, the amount of CO2 in the atmosphere has risen by about 50 percent, far above levels seen in the Earth's recent history.

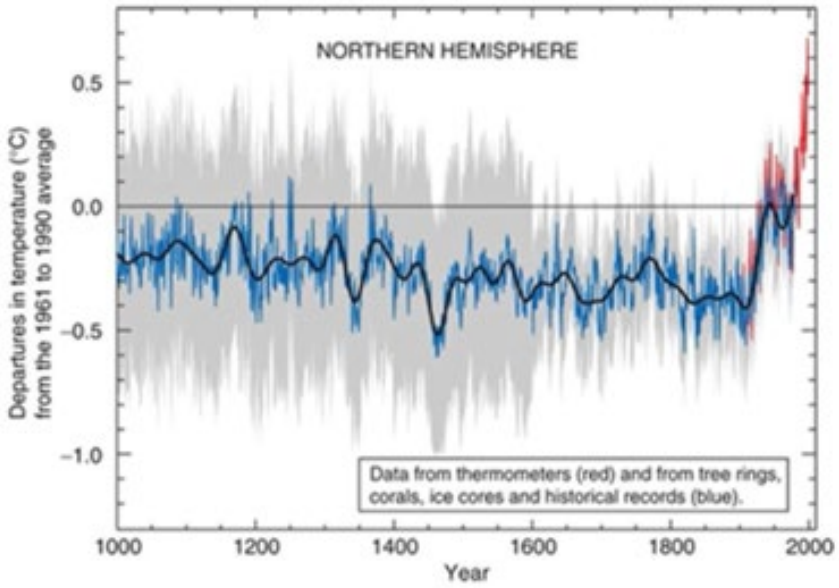

Figure 3. In 2001 the Intergovernmental Panel on Climate Change, IPCC replaced the observation of a cooling trend in the Northern Hemisphere into a warming trend based on data from thermometers, corals, ice cores and tree rings.

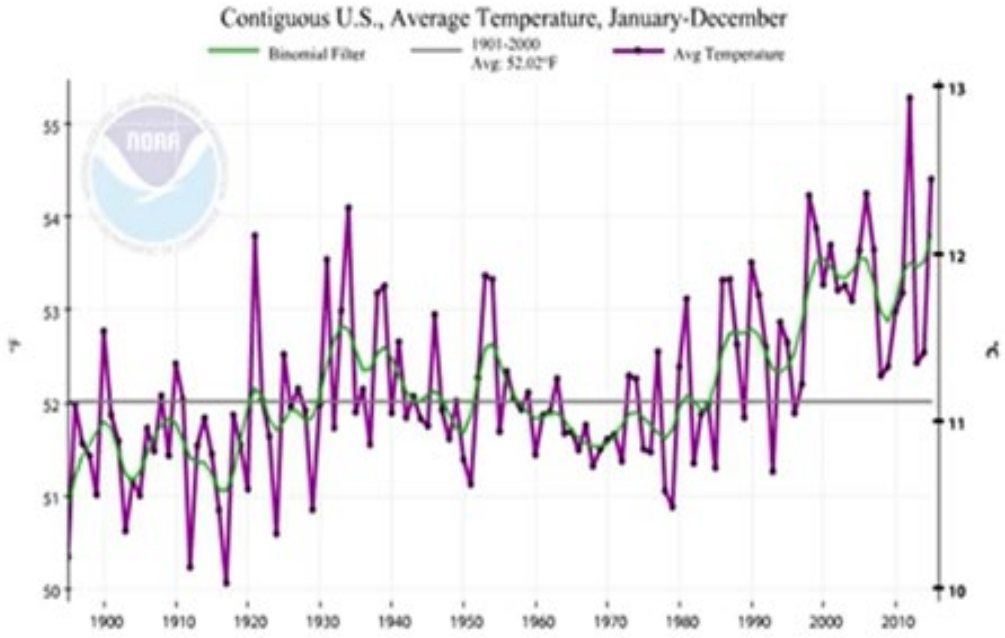

Figure 4. USA observation of a 2.5 ºF temperature increase in the USA since 1895. Source: NOAA.

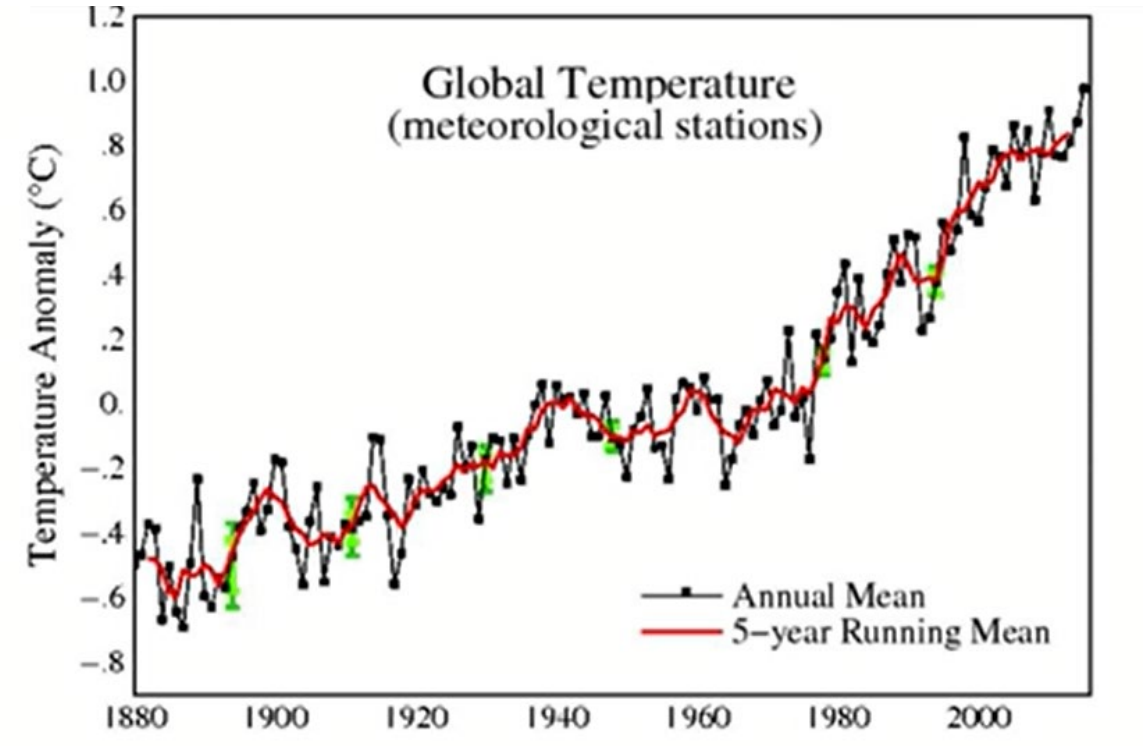

Figure 5. Global temperature increase anomaly from meteorological stations since 1880.

Table 1. Composition of Industrial and Anthropogenic gaseous emissions.

	Power plant (percent)	Person's breath (percent)
N_2	70	75
O_2	5	15
H_2O	5	6
CO_2	20	4

Climate Change is blamed in causing significant financial losses around the world, costing an average of $143bn (£113bn) per year between 2000 and 2019. Developing countries are already especially hard hit. As the climate changes, the impacts mount up, and such damages are expected to rise.

Island states represented by the Alliance of Small Islands States (AOSIS) are particularly vulnerable to climate change. While overall financial losses tend to be greater in richer countries, poorer countries suffer the most in terms of lives lost and disrupted economies, societies and ecologies.

Figure 6. Tuvalu in the Pacific Ocean consists of nine coral islands threatened by sea water rise.

PARIS AGREEMENT, 2015

The "Paris Agreement" was made by the world leaders in 2015 to try and prevent global temperatures rising, It involves a set of commitments:

1. To "pursue efforts" to limit global temperature rises to 1.5ºC, and to keep them "well below" 2.0ºC above those recorded in pre-industrial times.
2. To limit greenhouse gas emissions from human activity to the same levels that trees, soil and oceans can absorb naturally, known as "net zero", between 2050 and 2100.
3. Each country is to set its own emission-reduction targets, reviewed every five years to raise ambitions.
4. Richer countries to help poorer nations by providing funding, known as "climate finance", to adapt to climate change and switch to renewable energy

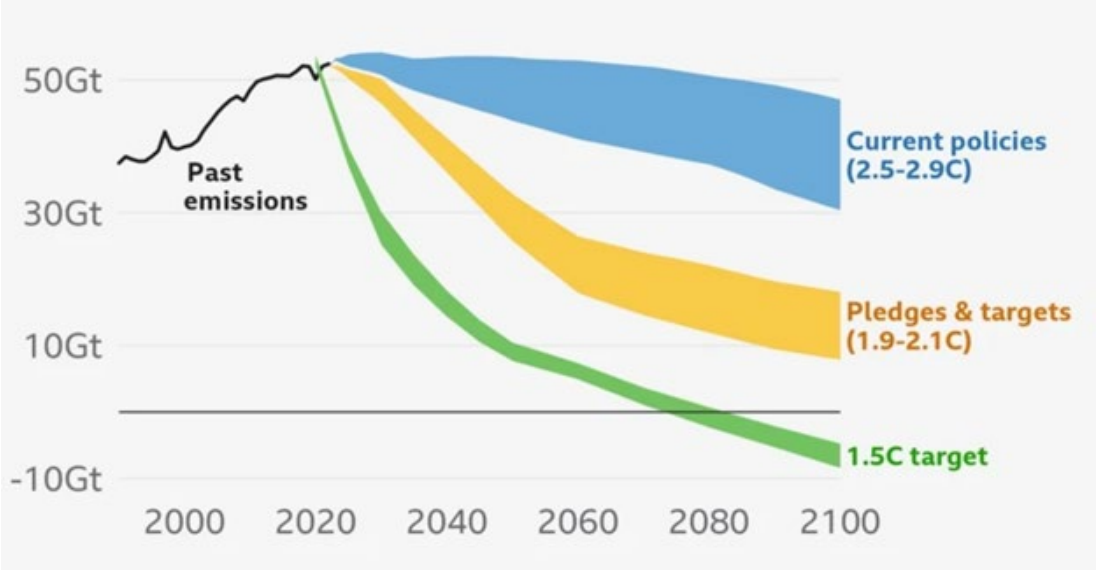

Figure 7. Projected greenhouse emissions in gigatons of CO_2 equivalents and future warming levels relative to pre-industrial level depending on action adopted. The 1.5 degrees Celsius target is missed. Source: Climate Action Tracker, November 2024, BBC.

The 1.5°C target is generally accepted to mean a 20-year average, rather than a single year.

As part of the agreement, countries are committed to developing a new cash target for developing nations by 2025. This fund would be used to help emerging economies cut their carbon emissions and adapt to the worst impacts of rising temperatures.

COP29 MEETING, BAKU, AZERBAIJAN, 2024

Figure 8. Conference of the Parties, COP29, Baku Azerbaijan, November 2024.

The COP29 goal is to set a concrete goal of $300bn (about £240bn) per year in climate finance from richer nations to developing countries by 2035 to help with the battle against climate change. It also gives a wider ambition to ramp up finance from a range of sources to at least $1.3tn. That is the figure that developing countries, except China, need from other nations every year by 2035, according to a recent UN-backed report.

This number makes finance ministers in developed countries sweat, because it implies that they will need to find new money for international climate action by raising taxes and limiting their welfare and warfare programs.

The world's Gross Domestic Product, GDP, a measure of the size of the world economy is around $110tn, according to the International Monetary Fund (IMF). The COP29 document "calls on" all countries to work together to scale up funding for developing countries to a whopping $1.3 trillion by 2035.

That is indeed a large value, but it includes all financing from public and private sources. The financing is to help poorer nations transition away from fossil fuels and to help make their countries resilient to the impacts our changing climate will have.

A smaller but perhaps more realistic value is $300bn. This figure is for the cash and loans directly generated by financing from richer countries. The figure is up from the presently adopted value of $100bn (£79.7bn) per year.

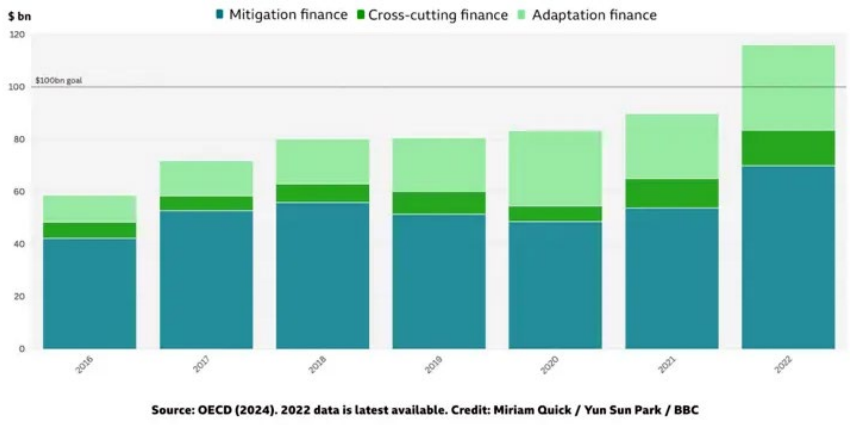

Figure 9. Developed countries missed the 2020 deadline for the $100bn global climate finance goal. Source: OECD, 2024.

CLIMATE CHANGE OBSERVED EFFECTS

A global average temperature increase of 1.2ºC has already had an effect on the environment, including:

1. More frequent and intense extreme weather, such as heatwaves and heavy rainfall,
2. Rapid melting of glaciers and ice sheets, contributing to sea-level rise,
3. Declines in Arctic sea-ice
4. Warmer oceans, which can fuel more intense storms and hurricanes and damage wildlife such as coral reefs.

These environmental changes are having consequences for people and economies around the world:

Hurricanes Helene and Milton, which hit parts of the USA in September and October 2024, could each costing at least $50bn (£40bn), according to estimates. More than 200 people were killed by Helene, and at least 16 by Milton. The winds and rain from both storms were worsened by climate change, according to scientists at the World Weather Attribution, WWA group.

In 2022, parts of East Africa suffered their worst drought for 40 years, putting more than 20 million people at risk of severe hunger. Climate change has made droughts like this at least 100 times more likely, the WWA says.

According to the UN, the consequences of a 2ºC global warming versus 1.5ºC could include:

1. Extreme hot days could become on average 4oC warmer at the mid-latitude regions outside the poles and tropics, versus 3ºC at 1.5ºC,
2. Sea-level rise could be around 0.1m higher than at 1.5ºC, exposing up to 10 million more people to events including more frequent flooding,
3. More than 99 percent of coral reefs could be lost, compared with 70-90percent at 1.5ºC,
4. Twice the number of plants and vertebrate animals with a backbone could be exposed to unsuitable climate conditions across more than half their geographical area,
5. Several hundred million more people may be exposed to climate-related risks and susceptible to poverty by 2050 than at 1.5ºC.

TIPPING POINTS

The call to restrict temperature rise to 1.5ºC was partly designed to avoid crossing the so-called "tipping points". Once these thresholds are passed, changes could accelerate and become irreversible, such as the collapse of the Greenland Ice Sheet.

About 3.3 to 3.6 billion people are highly vulnerable to climate change, according to the IPCC. People living in poorer countries are expected to suffer most as they have fewer resources to adapt. This has led to questions about fairness, because these places have typically only been responsible for a small percentage of greenhouse gas emissions, while impacts could be felt over wide areas. For instance, crop failures linked to extreme weather could raise global food prices.

MISSED GOALS

To help keep global warming to the 1.5ºC limit agreed in Paris in 2015, CO_2 emissions need to be "net zero" by 2050, the UN says.

The World Meteorological Organization WMO says that the last time the Earth experienced a comparable concentration of carbon in the atmosphere was 3-5 million years ago – when average temperatures were 2-3ºC warmer than they are now, and sea levels were 10-20 meters higher.

This suggests the need for reducing greenhouse gas emissions as much as possible and removing any remaining emissions from the atmosphere.

In fact, most countries have, or are considering, net zero targets. However, greenhouse gas levels are still rising quickly, and the world is "likely" to warm beyond 1.5ºC, the IPCC says.

There has been progress in some areas, such as the growth of renewable energy and the adoption of electric vehicles, EVs.

The UK is on the map of global climate leadership following its pledge to cut domestic emissions by 81percent before 2035.

One important group at the last COP is the African Group, made up of 54 nations. A major priority for them is getting enough money to help change their energy systems and economies to carry out their plans to respond to climate change.

The commitment coming out of Baku is $300bn a year from the richer countries to the poorer countries to tackle climate change. It is a long way short of the $2.4 trillion a year the Independent High Level Expert Group says they will need. That $1 trillion of that should come from richer countries that are responsible for the lion's share of the pollution that has pushed up global temperatures

Global efforts to tackle climate change are wildly off track, says the UN, as new data shows that warming gases are accumulating faster than at any time in human existence. Current national plans to limit carbon emissions would barely cut pollution by 2030, a UN analysis shows, leaving efforts to keep warming under 1.5ºC this century in tatters.

The update comes as a separate report shows that greenhouse gases have risen by over 11 percent in the last two decades, with atmospheric concentrations surging in 2023.

Researchers are also worried that forests are losing their ability to soak up carbon, which could be contributing to record levels of warming gas in the atmosphere.

Modest progress is being made in driving down emissions that are threatening to push global temperatures well above 1.5ºC this century, a level beyond which scientists say extremely damaging impacts will occur.

When existing plans are added up, they indicate that emissions will likely fall by just 2.6 percent by 2030 compared to 2019. This is far short of the 43 percent reduction that scientists say will be needed by the end of this decade to keep the world on track for "net-zero" carbon by 2050.

Current national climate plans fall short of what is needed to stop global heating from crippling every economy, and wrecking billions of lives and livelihoods across every country.

"CLIMATE FEEDBACK" ACCELERATED WARMING

Adding to the concerns about the way the world is handling climate change, the World Meteorological Organization WMO says that concentrations of greenhouse gases reached a record high in 2023. The rise was higher than the previous 12 months, due to record fires in Canada, and the onset of the El Niño weather event all adding to ongoing emissions from fossil fuels. The

WMO's scientists also says they have seen some evidence that as the world gets warmer, trees are not able to soak up the same level of CO_2 as they once were. Data indicates that the southeastern Amazon has now turned from a carbon sink to a carbon source. In the Amazon, deforestation means you lose the forest. Then the temperature started increasing, then the air circulation pattern changes. There is less precipitation, less uptake of CO_2, that means more CO2 stays in the atmosphere.

The Amazon is one example of what scientists call a "climate feedback" where rising temperatures can act on natural systems to enhance the causes of warming.

If the forests and the oceans become less able to soak up CO_2, global warming could accelerate more rapidly. Some clear signals are observed even though uncertainty because there is substantial variability because of El Niño and La Niña weather events.

USE OF CLIMATE ACTION FUNDS

Climate action funding falls into three categories:

1. **Loss and damage Fund**

At the COP27 in 2022 meeting world leaders agreed for the first time to establish a loss and damage fund. This money is to help developing countries recover from the effects of climate change they are already suffering.

2. **Mitigation**

Funds are allocated to help developing nations move away from fossil fuels and other polluting choices. This is where most money has been given to-date because it can often be profitable. Many countries still have coal power stations that are yet to reach the ends of their lives. They need support to switch to clean energy, such as solar and wind farms.

3. **Adaptation**

Funds target preparing developing nations for the worst effects of climate change. The needs vary, depending on where in the world the country is, but may include:

1. Building stronger flood defenses such as dams and levees,
2. Relocating populations at risk,
3. Developing storm proof housing,
4. Distributing crops that are more resilient to dry spells.

FUNDIND SOURCES

Rich countries have repeatedly broken a previous key climate finance goal: to deliver at least $100bn (£79.7bn) per year from 2020 onwards. They reached the goal for the first time in 2022, two years late.

Richer countries currently pay developing countries slightly over $40bn (£31.9bn) a year for climate action.

The same again originates from international development banks such as the World Bank, WB, the International Monetary Fund, IMF and others. They could and should be delivering more money, as many finance experts suggest. These institutions can borrow very cheaply on

international markets and could therefore lend more out at cheap rates. That could raise some $300bn for climate finance.

There is potentially a lot of clean energy resources in the developing world. If some cash is used to lower the high interest rates and reduce other risks private investors face in developing countries, it could unlock a further $500bn (£395.7bn) a year.

There is a need to encourage more countries to add to the pot such as China, Saudi Arabia and the UAE do not contribute now. There are other innovative ideas bouncing around such as levies on aviation and shipping.

Shile a trillion dollars per year is a very large sum of money, the prospect of raising it may not be quite as alarming as it sounds as the benefits would cover all of humanity.

DISCUSSION

Developing countries are complaining that the $300bn (about £240bn) a year in climate finance they will receive by 2035 is a "paltry sum." They complaint that it simply is not enough and that it was in fact a mixture of grants and loans. [1]. National plans are due to outline how every country will limit their planet warming gases over the next 10 years.

Developing nations are vying for rich countries to contribute trillions not billions to climate issues. Rich nations say any cash must be met with commitments to cut carbon emissions. Hydrocarbons producers such as Azerbaijan, Saudi Arabia and the UAE said they would reject any resolutions that target fossil fuels for elimination.

USA President Donald Trump pledged to withdraw the USA from the Paris climate agreement and “drill, baby, drill” for more fossil resources. This is “a major blow to global climate action," according to Christiana Figueres, the former UN climate chief. "But it cannot and will not halt the changes under way to decarbonize the economy and meet the goals of the Paris agreement.”

On an optimistic note, renewable sources of energy like biomass, wind and solar are growing rapidly, with the International Energy Agency (IEA) expecting global renewable capacity to grow 2.7 times by 2030 compared with its 2022 level.

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