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Analysis of today
Assessment of tomorrow

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COP31 promises a drop in temperature without agreeing who will pay for it



Negotiators at the UN COP31 climate conference in Antalya, Turkey, are debating a draft final decision that supports the rapid development of technologies to remove carbon dioxide (CO□) from the atmosphere, without a single mention of fossil fuels.

Removal involves extracting CO□ from the air and storing it permanently, usually deep underground.

The text, published on 19 November, states that projections indicate the peak of global warming will exceed the limit of 1.5 degrees above pre-industrial levels set by the Paris Agreement.

On 20 November, negotiations were still ongoing, with no confirmed final decision. Governments have yet to agree who will finance the removal on which they are basing their promises that the temperature will subsequently fall again.

The largest private buyer of these services has already slowed its ordering. According to calculations by BloombergNEF, Bloomberg's energy research service, Microsoft contracted to remove 8.55 million tonnes of CO□ from the beginning of the year to mid-July, about 80 per cent less than in the same period in 2025. The company replied that slower purchases do not alter its climate goals.

Governments that delay emissions reductions preserve current coal, oil and gas revenues, while increasing the amount of CO□ they will have to remove later. Without securing the necessary funding, they leave much of that work to subsequent governments and taxpayers.

Such a distribution of benefits and obligations is unacceptable, because climate policy should also protect populations that already suffer from floods, droughts and extreme heat.

Carbon capture at fossil power stations will not cool the planet

The draft explicitly warns that removing CO□ must not replace or delay deep emissions reductions. In the dedicated section on the capture, use and storage of that gas, known by the abbreviation CCUS, two negotiating options remain: at least 500 million tonnes per year, or between 1.3 and 2.5 billion tonnes per year until 2035.

Both are in square brackets, which in negotiating texts indicate wording on which states have not yet reached agreement. Neither specifies which countries should provide those quantities or who should pay for them.

These quantities include capturing CO□ in plants that burn coal, oil or gas. When gas is extracted from the chimneys of a cement plant or power station, some of the new emissions are prevented, but none of the CO□ already in the atmosphere is removed.

Removal refers to CO□ that is already in the atmosphere, and only lowers the temperature when that gas is permanently stored. With a power station that burns wood and other plant residues, the calculation is different because the plants absorbed CO□ from the air while growing, and when that gas is captured during combustion and permanently stored underground, it is actually removed from the atmosphere.

> UNEP examined a pathway in which warming would peak at around 1.7 to 1.8 degrees mid-century

From that amount, the emissions generated during the cutting, processing and transportation of that fuel, which reduce the actual performance, should be subtracted.

When both activities are run under the same name and collectively count towards the same goals, a coal-fired power station that only reduces its own pollution can be portrayed as helping to lower temperatures.

The 1.5-degree limit refers to average warming

over many decades, and a single year above that level, such as 2024, does not by itself mean the limit has been exceeded.

For temperatures to begin to fall after a prolonged overshoot, the world would need to remove more CO□ from the air than it emits, while strongly reducing other gases that contribute to warming, such as methane.

In an October report, the UN Environment Programme (UNEP) examined a pathway in which warming would peak at around 1.7 to 1.8 degrees mid-century, with about a 50 per cent chance of returning to 1.5 degrees or below by 2100.

That pathway requires reducing global emissions by 18 per cent by 2030, 45 per cent by 2035 and 69 per cent by 2040, relative to 2025, as well as removing and permanently storing approximately 320 billion tonnes of CO□ by the end of the century.

Microsoft is funding most new CO□ removal

The State of Carbon Dioxide Removal Report, prepared by an international team of researchers from Oxford, the University of Wisconsin and other institutions, estimates that about 2.2 billion tonnes of CO□ are removed from the atmosphere.

Almost all of that, 99.9 per cent, is achieved through forests and land. Newer technologies, such as extracting CO□ from the air for underground storage, remove about two million tonnes per year, roughly one in a thousand of the total.

If UNEP's 320 billion tonnes were spread evenly over the period from 2027 to 2100, more than four billion tonnes would need to be permanently removed each year, almost two thousand times more than current technologies achieve today.

Forests are not reliable for long-term storage, because carbon sequestered by trees can be released back into the atmosphere after fires or logging, and end-of-century cooling plans cannot treat it as permanent removal.

Companies pay for removals without a legal obligation when they have publicly pledged climate goals that they cannot achieve by reducing their own emissions alone.



In 2020, Microsoft pledged to remove more COâ□□ from the air than it emits by 2030

In 2020, Microsoft pledged to remove more CO□ from the air than it emits by 2030, and its data centres, equipment manufacturing and suppliers are still generating emissions that the company cannot quickly reduce.

For every tonne paid for, the customer receives a certificate, a so-called credit, proving that this quantity of CO□ has been removed on their behalf.

According to the report, companies have contracted to remove 30.2 million tonnes using newer technologies in 2025, nearly four times more than the year before, and Microsoft has contracted for 82 per cent of all such quantities in 2024 and 2025.

Buyers generally pay in advance for removals that will be carried out years later, and contractors, on the basis of those contracts, obtain bank loans and build plants. A signed contract does not yet mean that a single tonne has been removed.

Microsoft can maintain its climate goal while changing its purchasing schedule, leaving contractors without new contracts just when they need multi-year investments. State

commitments for the coming decades must withstand such changes without shifting unplanned costs onto citizens.

The gap between announcements and actual projects is large. According to the same report, companies have announced about 42 million tonnes of annual capacity for 2030, while plants in operation or under construction could provide approximately 8.4 million tonnes.

Even that smaller volume is not guaranteed, as it depends on completion of the works and reliable plant operation. A government that relies on the announced capacity must provide both funding and substitutes for any projects that fail.

The Danish model and the cost of delay

Denmark and Ethiopia organised a meeting in Antalya on how to ensure the world removes more CO□ than it emits. UNEP Executive Director Inger Andersen listed public procurement, mandatory purchase of removals and tax incentives as possible state instruments.

The Danish project illustrates what such financing looks like in practice, and what happens when the contractor is late.

In 2023, the Danish Energy Agency awarded Ørsted a 20-year government support contract to capture and store approximately 430,000 tonnes of CO□ per year from two biomass power plants, Asnæs in Kalundborg and Avedøre near Copenhagen, which burn wood and plant residues.

Microsoft has contracted to buy a total of 3.67 million tonnes of removed CO□ from the same power plants over approximately a decade. The captured gas will be transported by ship to Norway and stored deep beneath the North Sea floor.

> The cost must cover both verification of actual performance and proof that CO□ remains underground

The start of capture was planned for 2025, but Ørsted now says 2027. The company disclosed the costs of the delay in its 2025 annual report, and the contract model published with the Danish tender sets out penalties for undelivered quantities.

For a country that is factoring removals into its climate plan, two missed years mean lower-than-expected performance, even as the contractor bears the financial consequences.

The agency pays support per tonne of CO□ reduced and adjusts the amount according to the tax on that gas and the price in the European Emissions Trading System, in which polluters pay for permits for every tonne they emit. Funding is thus tied to measurable performance and pre-established rules.

The same tonne will be included in the Danish national emissions calculation and in Microsoft's climate target, and both the state and the company will pay for it. When the commitments of states and companies are aggregated, such a tonne must be reported only once, with public information on how much of its price is funded by the public budget and how much by the private sector.

The cost must cover both verification of actual performance and proof that CO□ remains underground. Subsidising construction without a reliable calculation of CO□ actually removed could leave citizens with both the bill for the plant and a broken climate promise.

Income now, obligations later

In its annual overview of world energy, published on 19 November, the International Energy Agency (IEA) considers the consequences of supply disruptions in the Strait of Hormuz, through which about a fifth

of global oil consumption normally passes. The disruption is described by the IEA as the biggest energy supply shock ever recorded.

If current policies continue, the agency estimates warming of approximately 2.9 degrees by 2100; with the implementation of measures officially announced by governments, this would fall to around 2.5 degrees.

An additional response to the crisis would reduce the estimate to just 2.4 degrees, although some of the benefits of cleaner technologies are offset by increased coal use.

Countries that produce oil are profiting from continued consumption, and the IEA lists the US, Canada and Brazil among those seeking to increase production. The cost of future removal could be partly paid today, as polluters in Europe buy permits for every tonne of CO□ they emit, and many countries also levy a special tax on the gas.

If some of that money were earmarked in advance for removal, those who burn coal, oil and gas today would pay for part of the work their emissions will require later, instead of leaving the bill to future governments.

While temperatures remain above the 1.5-degree limit for decades, floods, droughts and heatwaves will cause damage that any subsequent cooling cannot reverse.



The conference in Antalya is likely to conclude with a call for CO□□ removal to be accelerated, without deciding which country should pay how much

The UN Intergovernmental Panel on Climate Change (IPCC), a body that brings together scientists from around the world to assess the state of the climate, warns that the damage increases the longer and larger the overshoot, and that some of it is permanent, such as the disappearance of plant and animal species and sea levels that continue to rise.

Poorer countries must simultaneously repair roads and homes, build flood defences and pay their share of CO□ removal, all with much smaller budgets than richer countries.

For those countries, funding from richer nations to help protect them from the effects of climate change – such as levees, irrigation systems and more flood-resistant roads – is crucial. An earlier draft of the decision proposed that aid should reach $120 billion a year by 2035, but that figure was removed from the revised text.

In its place, the text calls for at least a tripling of aid, without specifying the baseline amount, and the UN expert committee on finance has yet to propose how it will be calculated. Poorer countries are therefore promised that there will be more money, but they do not know how much they will actually receive or when.

The conference in Antalya is likely to conclude with a call for CO□ removal to be accelerated, without deciding which country should pay how much. Funding will then be determined separately by each government through its own budget.

The first sign that governments are taking this seriously will be contracts like Denmark's, where the state pays for CO□ removal 10 or 20 years in advance, replacing private customers such as Microsoft.

The Danish project will be the first test of that model, as 2027 will show whether Ørsted can deliver what it has promised. By 2030, it will be possible to measure how much of the 42 million tonnes of announced capacity has actually been built, and how much exists only in corporate announcements.

Producers of oil, gas and coal will benefit most, because under UN rules emissions are attributed to the country where the fuel is burned, and the CO□ tax and European permits are paid by the emitter, while companies and countries that extract and sell oil are not held accountable for those emissions.

In 2024, the European Union demonstrated that it can act differently when it required oil and gas producers to provide, jointly and in proportion to their output, storage capacity for 50 million tonnes of CO□ per year by 2030.

Rich countries will be able to pay for the plants themselves and count them towards their climate goals. Poorer countries will not have the money for that either, and they will suffer most from the consequences of greater warming.

The Antalya draft promises that temperatures will fall again later, but does not say who will pay for the CO□ removal on which that promise depends. Until this is agreed, the bill for today's coal, oil and gas consumption remains with taxpayers, who will be paying it for decades to come.