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# Clash Over Climate Tipping Points and Fossil Fuels' Future at COP28

U.N. conference in Dubai kicks off as 2023 marks hottest year on record

By *Matthew Dalton* [Follow](#)

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This year is [the hottest on record](#), and evidence is growing that climate systems are hitting dangerous tipping points. That backdrop is intensifying a [fight over the future of fossil fuels](#) that is set to dominate the annual [United Nations climate conference](#) over the next two weeks.

New studies have found that several tipping points—from a collapse of Atlantic Ocean currents to drying of the Amazon rainforest—could be passed sooner than anticipated, some around the middle of this century. Loss of much of the West Antarctic ice sheet may already be unavoidable. Global temperatures, meanwhile, [set record highs](#) this year, the U.N.'s World Meteorological Organization said Thursday.

“We are now on the precipice of tipping points—the point at which events can simply unfold of their own momentum,” U.S.

climate envoy John Kerry said in a recent speech.

Governments from more than 190 countries are descending on Dubai for the [COP28 conference](#), which opens Thursday near some of the world's largest oil reserves. The threat of tipping points is driving demands from the U.S. and other governments for [sharp reductions in fossil-fuel burning](#) to fulfill the Paris accord, the landmark 2015 climate agreement. Western officials are calling for a global halt to the construction of coal-burning power plants.

Big developing countries such as China, India and Saudi Arabia are expected to resist, saying that poorer nations will need coal, oil and natural gas for decades to power economic growth and provide energy security.



View of an iceberg that calved from a West Antarctic ice shelf, evidence of possibly irreversible decline, as seen from a NASA research aircraft several years ago. PHOTO: MARIO TAMA/GETTY IMAGES

The U.N. said Thursday that 2023 is on track to be significantly hotter than the previous records. Through the end of October, the year was about 1.4 degrees Celsius above preindustrial levels, topping the 1.29 degrees reported in 2016. June, July, August, September and October each topped the previous records for the months, and July recorded the highest monthly temperature on record. The Paris agreement calls for governments to limit warming to “well below” 2 degrees since the preindustrial era and attempt to hold it to 1.5 degrees.

Incremental increases in average temperature can have a great [impact on climate systems](#). Scientists define a climate tipping point as a relatively small change that produces an effect that is irreversible over long periods, self-propelling and possibly sudden. Triggering one or more tipping points would significantly raise the costs of climate change, scientists and officials say.

The existence of tipping points means that the difference between 1.5 and 1.8 degrees could be enormous, said Tim Lenton, director of the Global Systems Institute at the University of Exeter in the U.K.

“Each 10th of a degree of warming from now on matters, and not all tenths of a degree are necessarily equal,” Lenton said.

“At some point there will be a 10th of a degree of warming that passes one or possibly more than one tipping point, which brings abrupt and/or irreversible damages.”

A collapse of Atlantic Ocean currents would threaten food production across the Northern Hemisphere. Rapid melting of the West Antarctic ice sheet is already pushing up sea levels. A rapid drying of the Amazon basin would threaten South America's entire ecosystem.



The approach of climate tipping points is intensifying debate at the COP28 Climate Conference in Dubai. PHOTO: SEAN GALLUP/GETTY IMAGES





Rapid drying of Brazil's Amazon basin would threaten South America's ecosystem. PHOTO: MICHAEL DANTAS/AGENCE FRANCE-PRESSE/GETTY IMAGES

“We should all hope that the point of no return has not been reached yet,” said Brazilian environment minister Marina Silva, describing the wildfires that have been encroaching deeper into the Amazon forest.

Global emissions would need to fall 43% by 2030 compared with 2019 to put the world on track to limit warming to 1.5 degrees.

Instead, [emissions are still rising](#), and national climate plans completed to date under the Paris accord would put the world on track for 2.5 degrees of warming by the end of the century, according to an analysis published in November by the U.N. Environment Program. The warming falls to 1.8 degrees after

taking into account long-term emission-reduction pledges and making certain optimistic assumptions, the analysis says.

Western officials say the conference in Dubai offers a chance for governments to agree to speed up their plans to cut greenhouse-gas emissions. It marks the first “global stocktake” required under the Paris accord, a review of progress since the agreement was signed eight years ago.

An analysis for the stocktake drafted by the U.S. and South Africa calls for the world to phase out burning fossil fuels unless the emissions are captured and stored, a technology still in its early stages.

“We were really delighted to see that language,” a European negotiator said. “We are anticipating that there will be pushback on this, and it will be hard-fought to get this language into a final political outcome.”

A growing body of research has shown that big changes in climate have often been abrupt. Ice-core samples from Greenland show evidence of a number of large, rapid temperature swings. Around 11,500 years ago, for example, scientists believe temperatures in the Northern Hemisphere

rose as much as 10 degrees Celsius in a few decades, the end of a cold period known as the Younger Dryas.



A view in October of degraded ice in Greenland, where ice-core samples reveal a number of large, rapid temperature swings through the millennia.

PHOTO: EPA-EFE/SHUTTERSTOCK

Around 5,500 years ago, the Sahara expanded by a third in as little as 100 years due to the interaction of slight changes in Earth's orbit with local climate patterns, said Victor Brovkin, a climate scientist at the Max Planck Institute for Meteorology in Germany.

“In geologic records, you always find these relatively fast changes,” Brovkin said.

One system that could be disrupted at warming between 1.5 and 2 degrees is known as the North Atlantic subpolar gyre, a current that flows around Greenland. Its collapse would make

summers in Europe hotter, winters colder and could raise the sea level along the Northeast U.S., scientists say.

A far more disruptive tipping point would be the collapse of a vast ocean current known as the Atlantic Meridional Overturning Circulation. A hotly debated [study published in July in the journal Nature](#) said a tipping point could arrive around midcentury. A collapse would shift rainfall patterns around the globe, cool the Northern Hemisphere, warm the Southern Hemisphere and stress agriculture worldwide, scientists say.

Ice-loss on the West Antarctic ice shelf is accelerating and would continue even if warming stopped altogether—an unlikely prospect, says Kaitlin Naughten, a climate scientist at the British Antarctic Survey.

“There is some amount of sea-level rise locked in that we need to make a plan to react to,” Naughten said. “If the warming of the ocean speeds up, that would only bring us to the point that the retreat is unstoppable.”

*—Luciana Magalhaes contributed to this article.*

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## Corrections & Amplifications

Kaitlin Naughten is a climate scientist at the British Antarctic Survey. An earlier version of this article misspelled her last name as Naughton in one instance.

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