

Stopping Climate Change Is Doable, but Time Is Short, U.N. Panel Warns

A major new scientific report offers a road map for how countries can limit global warming, but warns that the margin for error is vanishingly small.



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Nations need to move away much faster from fossil fuels to retain any hope of preventing a perilous future on an overheated planet, according to a major new report on climate change released on Monday, although they have made some progress because of the falling costs of clean energy.

The report by the Intergovernmental Panel on Climate Change, a body of experts convened by the United Nations, warns that unless countries drastically accelerate efforts over the next few years to slash their emissions from coal, oil and natural gas, the goal of limiting global warming to 1.5 degrees Celsius, or 2.7 degrees Fahrenheit, will likely be out of reach by the end of this decade.

That's the threshold beyond which scientists say the dangers of global warming — including worsening floods, droughts, wildfires and ecosystem collapse — grow considerably. Humans have already heated the

planet by an average of 1.1 degrees Celsius since the 19th century, largely by burning fossil fuels for energy.

But the task is daunting: Holding warming to just 1.5 degrees Celsius would require nations to collectively reduce their planet-warming emissions roughly 43 percent by 2030 and to stop adding carbon dioxide to the atmosphere altogether by the early 2050s, the report found. By contrast, current policies by governments are only expected to reduce global emissions by a few percentage points this decade. Last year, fossil fuel emissions worldwide rebounded to near-record highs after a brief dip as a result of the coronavirus pandemic.

“This is a climate emergency,” said United Nations Secretary General António Guterres, adding that wealthy economies and corporations “are not just turning a blind eye; they are adding fuel to the flames. They are choking our planet, based on their vested interests and historic investments in fossil fuels, when cheaper, renewable solutions provide green jobs, energy security and greater price stability.”

The report, which was approved by 195 governments and lays out strategies that countries could pursue to halt global warming, comes as Russia’s invasion of Ukraine has caused oil and gas prices to skyrocket, diverting political attention from climate change. In the United States and Europe, leaders are focused on shoring up domestic fossil fuel supplies to avoid price spikes and energy shortages, even if that means higher short term emissions.

Yet climate scientists say there is little margin for delay if the world wants to hold global warming to relatively tolerable levels.

“Every year that you let pass without going for these urgent emissions reductions makes it more and more difficult,” said Jim Skea, an energy researcher at Imperial College London who helped lead the report, which was compiled by 278 experts from 65 countries. “Unless we really do it immediately, it will not be

possible to limit warming to 1.5 degrees.”

But even if that goal becomes unattainable, scientists said, it will still be worthwhile for countries to slash emissions as quickly as possible to prevent as much warming as they can. Every additional rise in global temperatures increases the perils that people face around the world, such as water scarcity, malnutrition and life-threatening heat waves, the U.N. panel has found.

“Every fraction of a degree matters,” Dr. Skea said. “Even if we go beyond 1.5, that doesn’t mean we throw up our hands and despair.”

Scientists say that global warming will largely halt once humans stop adding heat-trapping gases to the atmosphere, a concept known as “net zero” emissions.

The new report contains glimmers of optimism. Over the past decade, many nations have adopted ambitious climate policies, scaled back plans for new coal plants and used subsidies and regulations to expand renewable energy. Although emissions from fossil fuels are still growing worldwide, the rate of growth slowed in the 2010s, compared with the 2000s, the report said, and humanity now has a much better shot at avoiding some of the worst-case global warming scenarios once widely feared by scientists.



Wind turbines and a solar farm in Rapshagen, Germany, last year. Michael Sohn/Associated Press

Clean energy technology has advanced far more quickly than expected, the report said. Since 2010, the costs of solar panels and lithium-ion batteries for electric vehicles have plunged by 85 percent, while the cost of wind turbines has fallen by more than half.

Rapidly shifting away from the fossil fuels that have underpinned economies for more than a century will require nations to do much more, however. Over the next decade, governments and companies would need to invest three to six times the roughly \$600 billion they currently spend annually on encouraging clean energy and cutting emissions, the report said.

But the cost of inaction is also substantial, in terms of deaths, displacement and damage. In the United States last year, damages from floods, wildfires, drought and other disasters related to weather and climate totaled approximately \$145 billion, according to the National Oceanic and Atmospheric Administration. The agency said that “extremely high” levels of disasters were becoming “the new normal.”

“Reducing emissions substantially is much less painful than you would think, and probably beneficial in the short term,” said Glen Peters of the Center for International Climate Research in Oslo, Norway, who contributed to the report.

The new report examines dozens of strategies proposed by scientists and energy experts to help nations make the transition.

First, countries would need to clean up virtually all power plants worldwide that generate electricity for homes and factories. That means relying more on wind, solar, nuclear, geothermal or hydropower. Most of the world’s coal and natural gas plants would either need to shut down or install carbon capture technology that can trap emissions and bury them underground. Such technology has been slow to take off because of its high costs.

The next step would be to reconfigure transportation, industry and other segments of the global economy to run on clean electricity rather than fossil fuels. Cars powered by gasoline could be replaced with electric vehicles charged by low-carbon grids. Gas-burning furnaces in homes could be swapped out for electric heat pumps. Instead of burning coal, steel mills could shift to electric furnaces that melt scrap.

At the same time, nations could take steps to reduce their total energy demand. That could entail expanding public transit, upgrading insulation so homes consume less energy, recycling more raw materials and making factories more energy efficient. At the high end, such demand-side policies could help cut emissions

in key sectors as much as 40 to 70 percent by 2050, the report notes.

But many economic activities can't be easily electrified. Batteries are still too heavy for most airplanes. Many industries, like cement and glass, require extreme heat and currently burn coal or gas. For those emissions, governments and businesses will have to develop new fuels and industrial processes, the report said.



A fire set by farmers for the deforestation process in the Amazon jungle last year. Federico Rios for The New York Times

Countries will also need to address emissions from deforestation and agriculture, which account for around a fifth of global greenhouse gases. That means dealing with issues like global meat production, which emits methane and carbon dioxide, and is causing rampant deforestation in vital places like the Amazon rainforest.

Forests and wetlands naturally store carbon dioxide, which makes sparing them from destruction a highly effective and economical way to mitigate warming, said Stephanie Roe, a World Wildlife Fund scientist who helped write the report. “I can’t reiterate enough the importance of conserving those ecosystems,” she said.

Even in the best case, humanity is unlikely to eliminate all of its planet warming emissions, the report warned. So countries will likely also have to devise ways to remove billions of tons of carbon dioxide from the atmosphere each year by around midcentury. One strategy could be to plant more trees, although that may not be enough, the report cautioned. Other options include devices that suck carbon out of the air, though these technologies are still immature.

The report acknowledges the enormous challenges ahead. Winding down coal, oil and gas projects would mean job losses and financial dislocation. Some climate solutions come with major trade-offs: Protecting forests, for instance, leaves less land for growing crops or raising livestock to feed a world population that keeps growing.

And some of the biggest obstacles to climate action are political, not technological. The report notes that “incumbent fossil fuel interests” often work to thwart policies to cut emissions. Organized disinformation campaigns by climate change deniers have, in some places, increased political polarization over the issue. And politicians tend to avoid difficult decisions if the benefits are not felt beyond the current election cycle.

In the developing world, governments still need to expand access to electricity and modern cooking fuels

for hundreds of millions of the poorest people, which might only be possible in the short term by burning more fossil fuels. These nations have benefited from advances in renewable energy technology, but efforts to cut emissions deeply have run up against two longstanding issues: high costs and overstretched governments.

“If technology could solve the problem completely, the problem could have been solved two or three decades ago,” said Wei Shen, a researcher at the Institute of Development Studies, a think tank in Britain, who helped write the report.

There is strong political will in many developing nations to tackle climate change, said Fatima Denton, director of the United Nations University Institute for Natural Resources in Africa and another author of the report. But greater financial support from wealthy nations is critical, she said, partly as a matter of fairness and historical responsibility: Western countries that got rich by burning fossil fuels are now effectively telling poor nations that they cannot do the same.

“You’re telling them to leave their resources in the ground, when they have always more or less seen these as the route to more capitalism, more wealth, more prosperity,” Dr. Denton said.

China’s leader, Xi Jinping, said last year that his country would stop building new coal plants overseas, a major step toward promoting green energy in the developing world. At home, though, China is digging up and burning more coal to keep electricity flowing amid the economic disruptions of the war in Ukraine and the coronavirus pandemic. China is the planet’s top emitter of greenhouse gases.



Piles of coal in a warehouse in Shanxi Province, a major Chinese coal source. Gilles Sabrié for The New York Times

“It’s unfortunate: These recent crises just demonstrate that if decarbonization happened earlier, then China, as well as other regions, would have been more resilient to some of these shocks,” said Cecilia Han Springer, a China expert at Boston University. “But that means there’s also an opportunity to double down.”

India’s government has increased energy efficiency in homes and factories, given farmers solar-powered water pumps and helped promote the rapid construction of solar farms. But the country’s state-run electric utilities remain in fragile fiscal health, meaning there is no guarantee that efforts to expand clean energy will be financially sustainable.

In remarks Monday, Mr. Guterres urged people around the world to press for action. “If you live in a big city, a rural area, or a small island state, if you invest in the stock market, if you care about justice, and our children’s future, I am appealing directly to you,” he said. “Demand that renewable energy is introduced now — at speed and at scale. Demand an end to coal-fired power. Demand an end to all fossil fuel subsidies.”

Worldwide, slashing emissions requires overhauling the way governments, businesses and even societies work, said Dr. Denton of the United Nations University. “That’s not an overnight thing, and it comes with some cost, whether we like it or not.”