

Do climate lawsuits lead to action? Researchers assess their impact

Litigation can lead governments to strengthen their climate policies and curb companies' greenwashing, say scientists.

Climate litigation is in the spotlight again after a landmark decision this month. The top European human-rights court deemed that the Swiss government was violating its citizens' human rights through its lack of climate action. The case, brought by more than 2,000 older women, is one of more than 2,300 climate lawsuits that have been filed against companies and governments (see 'Climate cases soar').

But does legal action relating to climate change make a difference to nations' and corporations' actions? Litigation is spurring on governments and companies to ramp up climate measures, say researchers.

"There are a number of notable climate wins in court that have led to action by governments," says Lucy Maxwell, a human-rights lawyer and co-director of the Climate Litigation Network, a non-profit organization in London.

Nature explores whether lawsuits are making a difference in the fight against global warming.

What have climate court cases achieved?

One pivotal case that spurred on change was brought against the Dutch government in 2013, by the Urgenda Foundation, an environmental group based in Zaandam, the Netherlands, along with some 900 Dutch citizens. The court ordered the government to reduce the country's greenhouse-gas emissions by at least 25% by 2020, compared with 1990 levels, a target that the government met. As a result, in 2021, the government announced an investment of €6.8 billion (US\$7.2 billion) towards climate measures. It also passed a law to phase out the use of coal-fired power by 2030 and, as pledged, closed a coal-production plant by 2020, says Maxwell.

In 2020, young environmental activists in Germany, backed by organizations such as Greenpeace, won a case arguing that the German government's target of reducing greenhouse-gas emissions by 55% by 2030 compared with 1990 levels was insufficient to limit global temperature rise to "well below 2 °C", the goal of the 2015 Paris climate agreement. As a result,

the government strengthened its emissions-reduction target to a 65% cut by 2030, and set a goal to reduce emissions by 88% by 2040. It also brought forward a target to reach 'climate neutrality' — ensuring that greenhouse-gas emissions are equal to or less than the emissions absorbed from the atmosphere by natural processes — by 2045 instead of 2050. "In the Netherlands and Germany, action was taken immediately after court orders," says Maxwell.

In its 2022 report, the Intergovernmental Panel on Climate Change acknowledged for the first time that climate litigation can cause an "increase in a country's overall ambition to tackle climate change" (see [go.nature.com/3szixnv](https://www.nature.com/3szixnv)).

"That was a big moment for climate litigation, because it did really show how it can impact states' ambition," says Maria Antonia Tigre, director of the Sabin Center for Climate Change Law at Columbia University in New York City.

What about cases that fail?

Cases that fail in court can be beneficial, says Joana Setzer at the Grantham Research Institute on Climate Change and the Environment at the London School of Economics and Political Science.

In a 2015 case called *Juliana v. United States*, a group of young people sued the US government for not doing enough to

slow down climate change, which they said violated their constitutional right to life and liberty. "This is a case that has faced many legal hurdles, that didn't result in the court mandating policy change. But it has raised public awareness of climate issues and helped other cases," says Setzer.

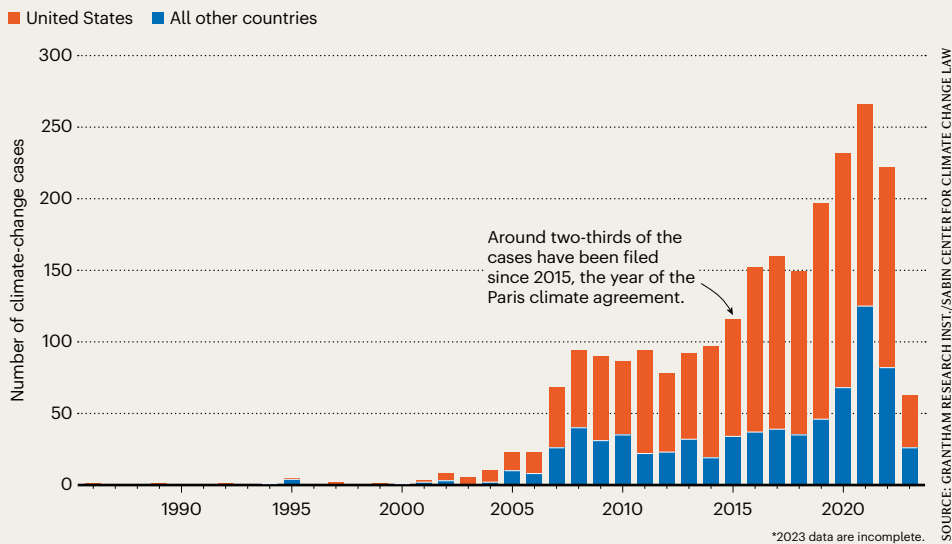
One lawsuit that benefited from the Juliana case was won last year by young people in Montana, says Setzer. The court ruled that the state was violating the plaintiffs' right to a "clean and healthful environment", by permitting fossil-fuel development without considering its effects on the climate. The ruling means that the state must consider climate change when approving or renewing fossil-fuel projects.

What happens when people sue companies?

In a working paper, Setzer and her colleagues found that climate litigation against corporations can dent the firms' share prices (see [go.nature.com/3jj8bd1](https://www.nature.com/3jj8bd1)). The researchers analysed 108 climate lawsuits filed between 2005 and 2021 against public US and European corporations. They found that case filings and court judgments against big fossil-fuel firms, such as Shell and BP, saw immediate drops in the companies' valuations and share prices. "We find that, especially after 2019, there is a more significant drop in share prices," says Setzer. "This sends a strong

CLIMATE CASES SOAR

More than 2,340 legal cases relating to climate change have been filed in courts since 1986. Lawsuits have been registered in 51 countries in all regions of the world.



message to investors, and to the companies themselves, that there is a reputational damage that can result from this litigation,” she says.

In an analysis of 120 climate cases, published on 17 April by the Grantham Research Institute, Setzer’s team found that climate litigation can curb greenwashing in companies’ advertisements — this includes making misleading statements about how climate-friendly certain products are, or disinformation about the effects of climate change (see go.nature.com/3unzqjib). “With litigation being brought, companies are definitely communicating differently and being more cautious,” she says.

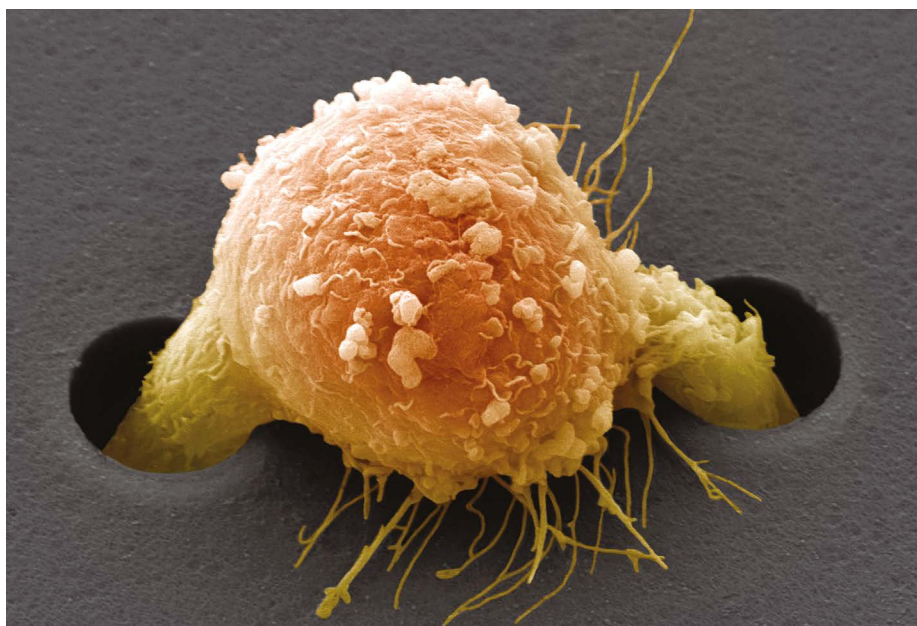
What’s coming next in climate litigation?

Maxwell thinks that people will bring more lawsuits that demand compensation from governments and companies for loss and damage caused by climate change. And more cases will be focused on climate adaptation — suing governments for not doing enough to prepare for and adjust to the effects of climate change, she says. In an ongoing case from 2015, Peruvian farmer Saúl Luciano Lliuya argued that RWE, Germany’s largest electricity producer, should contribute to the cost of protecting his hometown from floods caused by a melting glacier. He argued that planet-heating greenhouse gases emitted by RWE increase the risk of flooding.

More cases will be challenging an over-reliance by governments on carbon capture and storage (CCS) technologies — which remove carbon dioxide from the atmosphere and store it underground — in reaching emissions targets, says Maxwell. CCS technologies have not yet proved to work at a large scale. For instance, in February, researchers criticized the European Union for relying too much on CCS in its plans to cut greenhouse-gas emissions by 90% by 2040 compared with 1990 levels.

“There is a tendency now for companies and governments to say, we’ll use carbon capture, we’ll find some technology,” says Setzer. “In the courts, we’ll start seeing to what extent you can count on the future technologies, to what extent you really have to start acting now.”

By Carissa Wong



STEVE GOSCHMEISSNER/SPL

A breast cancer cell (artificially coloured) climbs through a supportive film in the laboratory.

AI TRACES MYSTERIOUS METASTATIC CANCERS TO THEIR SOURCE

Algorithm examines images of metastatic cells to identify the location of the primary tumour.

By Smriti Mallapaty

Some stealthy cancers remain undetected until they have spread from their source to distant organs. Now scientists have developed an artificial intelligence (AI) tool that outperforms pathologists at identifying the origins of metastatic cancer cells that circulate in the body. The proof-of-concept model could help doctors to improve the diagnosis of late-stage cancer and extend people’s lives.

“That’s a pretty significant finding — that it can be used as an assistive tool,” says Faisal Mahmood, who studies AI applications in health care at Harvard Medical School in Boston, Massachusetts.

Elusive origins

To treat metastatic cancers, doctors need to know where they came from. The origin of up to 5% of all tumours cannot be identified, and the prognosis for people whose primary cancer remains unknown is poor.

One method used to diagnose tricky metastatic cancers relies on tumour cells found in fluid extracted from the body. Clinicians examine images of the cells to work out which type of cancer cell they resemble.

For example, breast cancer cells that migrate to the lungs still look like breast cancer cells.

Every year, of the 300,000 people with cancer who are newly treated at the hospital affiliated with Tianjin Medical University (TMU) in China, some 4,000 are diagnosed using such images, but around 300 people remain undiagnosed, says Tian Fei, a colorectal-cancer surgeon at TMU.

Tian, Li Xiangchun, a bioinformatics researcher who studies deep learning at TMU, and their colleagues wanted to develop a deep-learning algorithm to analyse these images and predict the origin of the cancers. Their results were published on 16 April (F. Tian *et al. Nature Med.* <https://doi.org/mr2n;2024>).

Tumour training

The researchers trained their AI model on some 30,000 images of cells found in abdominal or lung fluid from 21,000 people whose tumour of origin was known. They then tested their model on 27,000 images and found that there was an 83% chance that it would accurately predict the source of the tumour. Moreover, there was a 99% chance that the source of the tumour was included in the model’s top three predictions.

Having a top-three list is useful because it can help clinicians to reduce the number