

# nature

## From climate leader to carbon laggard

**The United Kingdom, which proudly hosted the 2021 United Nations climate summit, is ignoring the advice of its own researchers.**

**O**n 20 September, UK Prime Minister Rishi Sunak made a shock announcement that is reverberating around the world. In the week when the world's scientists and diplomats were recommitting to the United Nations Sustainable Development Goals, he announced that the United Kingdom will delay its decarbonization plans.

A ban on the sales of new petrol and diesel cars will be postponed from 2030 to 2035. A planned 2030 phase-out of new gas-fired boilers for heating homes is to be pushed back by the same amount. Earlier this year, and to widespread criticism, the government announced a new round of exploration licences for oil and gas companies. And a plan to expand capacity for offshore wind energy is on hold.

There has been some welcome news. Sunak reconfirmed on 20 September that the United Kingdom will be contributing £1.62 billion (US\$2 billion) to the latest replenishment of the Green Climate Fund for adaptation and mitigation in low- and middle-income countries. Moreover, he said, £150 million (\$184 million) will be distributed between 50 scientists and engineers to develop “breakthrough green technologies”.

But the decision to hit the brakes on UK decarbonization is misguided. It isn't known which scientists or businesses were consulted, and many UK researchers across fields from climate to energy policy, engineering and hydrology, have gone public with their concerns. The overarching problem, as summarized by Christopher Knibb, director of policy at the Institution of Engineering and Technology in Stevenage, UK, is that Sunak sees the 2030 deadlines as a burden, rather than an opportunity. Many businesses of all sizes are well on the way to transforming their energy sources, supply chains and operations, and are dismayed by this week's developments. The UK Royal Academy of Engineering has been asked to administer the breakthrough-technologies fund, but its president, Jim McDonald, did not hide his disappointment when he said: “Government will need to provide policy stability that transcends electoral cycles and administrations if business is to plan with confidence and play its full role.”

Leaders are expected to show ambition and vision. The lectern from which Sunak spoke was emblazoned with: “Long-term decisions for a brighter future”. But the evidence is of short-term thinking that risks dividing people and will certainly divide political parties. There are no sunlit uplands in the country's future, just a gloomier tomorrow.

The core of Sunak's speech had two arguments: that



UK Prime Minister Rishi Sunak speaks to journalists on 20 September.

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climate policies are hurting citizens and that it is necessary to go slow to retain public confidence in mitigating environmental change. In a cost-of-living crisis, he argued, people should not be told to buy electric vehicles or change from gas to electric heating. Sunak also said, without citing proof, that slower decarbonization will still allow the country to achieve net-zero emissions by 2050, a target enshrined in UK law. The government's own expert advisers do not agree.

The speech also displayed a lack of awareness of research on what pumping carbon dioxide into the atmosphere is already doing to the planet and to vulnerable people. It is the poorest people, both in the United Kingdom and globally, who are among the most vulnerable to climate-related weather extremes – because they lack the resources to insulate themselves from economic and other shocks (X. Sheng *et al. Environ. Sci. Pollut. Res.* **30**, 77771–77783; 2023).

Hydrologist Hannah Cloke at the University of Reading, UK, was right when she told the Science Media Centre in London: “The effects of runaway climate change are understood by the whole world, and agreed on by the UK government” through the Intergovernmental Panel on Climate Change.

Sunak's speech could have been written 30 years ago: it rehearsed decades-old arguments to stop or delay action to protect the environment. These were laid to rest by the 2015 Paris climate agreement and it is simply wrong to reintroduce them now. When Sunak attends this year's UN climate conference in Dubai, representatives of low- and middle-income countries could legitimately argue that they have a better case than the United Kingdom for slowing down decarbonization, because they have more vulnerable people, with even lower incomes.

Sunak's announcement sadly also reintroduces politics into climate policy, ending a carefully constructed cross-party, cross-sector, science-based consensus. In 2008, a Labour government put climate commitments into law.

This was strengthened by two Conservative governments. Then-prime minister Theresa May decreed in 2019 that the United Kingdom would have net zero emissions by 2050. The following year, her successor, Boris Johnson, oversaw the legislation to phase out new petrol and diesel engines.

There are many things the current government could do now to improve the lives of the poorest people. It could mandate that those with the lowest incomes always pay the lowest energy prices; it could invest on a larger scale in home insulation to keep bills down and reduce carbon footprints. A nationwide education and training programme could give people access to green jobs, especially in the United Kingdom's many deprived areas.

Carbon budgets and net-zero deadlines are not a game, and the future of our planet is not an issue on which to create divisions. When he came into office, Sunak presented himself as a steady hand. He works within a consensus of research and expertise in economic policy. He has recognized the necessity of restoring UK researchers to their important place as part of the funding system Horizon Europe. He is talking to educators about how to encourage more young people to study mathematics at school. It is just as important to engage with, not ignore, expert advice in climate and energy science and policy. It is not too late to change course.

## AI will transform science – now researchers must learn to tame it

**A new *Nature* series will explore the many ways in which AI is changing science, and how it can be safely integrated into research.**

**T**he number of research fields touched by artificial intelligence (AI) is rising all the time. From protein folding to weather forecasting, and from medical diagnostics to science communication, the list seems to grow by the day. The proportion of papers in the Scopus database that mention AI or AI-related keywords in the title or abstract now stands at 8%, up from 2% a decade ago, according to an analysis by *Nature*.

Meanwhile, AI has also been changing. Whereas the 2010s saw a boom in the development of machine-learning algorithms that can help to discern patterns in huge, complex scientific data sets, the 2020s have ushered in a new age of generative AI tools pre-trained on vast data sets that have much more transformative potential.

But precisely how and why AI in its various forms is

affecting science – and, indeed, whether or how all of the purported benefits will be realized – is itself an emerging story. A *Nature* survey has captured the views of more than 1,600 researchers from around the world (see page 672). It marks the launch of a new series on the role of AI in science. We intend to draw on these results as we dive deeper into what researchers are saying about AI and so inform the conversation about the technology's potential – and its pitfalls. All of the material in *Nature's* series will be accessible on one website (see [go.nature.com/3jz1uvw](https://go.nature.com/3jz1uvw)).

Survey respondents told us, for example, that they are using AI to process data, write code and help them write papers. One clear benefit for many is in English-language science communication. Generative-AI tools powered by large language models (LLMs), notably ChatGPT, help researchers whose first language is not English, but who need to use English to publish their research. Scientists can use LLMs to improve their writing style and grammar, and to translate and summarize other people's work.

AI is also widely being used in science education around the world. Students at schools and universities regularly use LLM tools to answer questions, and teachers are starting to recognize that curricula and methods of pedagogy will need to change to take this into account.

But respondents also reported concerns, many of which mirror those held in wider society about AI technologies. These range from the lack of transparency of 'black box' systems, in which the underlying reasons why an AI reaches the results it does are not clear, to fears over training data including biased information. Researchers are also concerned about the harms that could be caused by AI spreading misinformation, and the prospect of AI-generated fake studies. These concerns hold particular weight in science. If we lose trust in primary scientific literature, we have lost the basis of humanity's corpus of common shared knowledge.

Another factor that survey respondents commented on is the dominant part corporations are playing in the development of AI. Companies are valuable contributors to science, technology and innovation. But the scale of their ownership of AI, in terms of both the technology and the human data needed to power it, is greater than in the past. Researchers need access to data, code and metadata. Producers of black-box systems need to recognize the necessity of making these available for research if AI claims are to pass verification and reproducibility tests. But the speed at which AI is developing means regulators are still playing catch-up.

In the coming weeks and months, we will be further exploring these and other questions about the influence of AI on science, including how AI will affect scientific publishing, and whether, for example, peer reviewers need to be trained to identify the use of AI in studies.

Now is the time to determine which aspects of research and society AI can be safely integrated into, and how to go about it. The coming deluge of AI-powered information must not be allowed to fuel a flood of untrustworthy science. Science and humanity stand to benefit from AI, provided it is applied in the right way. A comprehensive understanding of the potential dangers of this technology is an essential prerequisite for its safe use.



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