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European Union can break free from Russia's fossil fuels

The need to bring a rapid end to many nations' reliance on Russian gas, coal and oil opens the way for a faster transition to clean energy.

Vladimir Putin's invasion of Ukraine initiated Europe's largest war since the Second World War. The United States and many European nations have responded to the Russian president's actions by cutting trading, financial and scientific links with Russia on a scale never previously seen for a permanent member of the United Nations Security Council.

But Europe's energy needs are stopping many countries from taking even stronger action on the economic front. Russia supplies the European Union with around 40% of its natural gas, as well as about 25% of its oil and almost 50% of its coal. And this trade is continuing. It's a weakness that Putin has exploited. Last week, he passed a decree stating that the gas supplies of "unfriendly" nations would be turned off if customers didn't pay in roubles (rather than US dollars or euros).

Putin's move seems to be intended as both a retaliation against sanctions and an attempt to shore up the rouble; the currency lost around half of its value in the 2 weeks after the 24 February invasion, reaching a record low of roughly 150 roubles to the dollar. It has since rebounded, but the outlook remains volatile.

European leaders rightly rejected Putin's demands and, for now at least, the Kremlin looks to be backing down. Researchers and analysts think Putin is unlikely to cut off gas supplies because Russia would lose a large fraction of its daily €700-million (US$771-million) income from the EU — money that it is currently using to support its military. And Russia is not in a position to recoup this loss by redirecting its gas supplies to friendlier countries, because this would necessitate the construction of new infrastructure, which cannot be done quickly.

Whatever happens, the threat is a sign that the EU needs to accelerate its efforts to relinquish its dependence on Russia's fossil fuels. It also underscores something that researchers who study climate, energy and economics have been saying for decades: that climate security and energy security are linked.

Researchers contacted by *Nature* say that European countries should be able to get through the next winter without Russian imports or power outages. However, to do so would require immediate action on many fronts, including intensive international cooperation to boost imports of natural gas from other countries; the launch of a burst of clean-energy projects; and the introduction of a host of energy-conservation and efficiency measures, possibly including energy rationing.

ANDREY RUDAKOV/BLOOMBERG VIA GETTY

The Nord Stream 2 pipeline was designed to boost Europe's Russian gas imports.

> **"Fossil fuels destabilize not only the climate, but also geopolitics."**

If the immediate goal is to keep the lights on, the long-term goal must be decarbonization, which will allow Europe to simultaneously end its dependence on Russia and meet its climate goals. As this week's report from the Intergovernmental Panel on Climate Change indicates (see go.nature.com/3k7vgu0), it means rapidly replacing the fossil fuels that power national and regional electricity systems with renewable alternatives. It also means deploying vehicles that run on electricity or renewably sourced hydrogen, and retrofitting homes and businesses to use less — and produce more — energy. Moreover, a suite of energy and carbon-capture strategies will be needed to clean up heavy industry. None of this will be easy, but if the world wants both a more secure and a cleaner future, we don't have a choice.

Scientists and environmentalists have been making this case for decades, warning governments that fossil fuels destabilize not only the climate, but also geopolitics, by

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creating dependencies on problematic regimes.

Whether or not European countries decide to stop buying Russian gas, they will almost certainly experience considerable economic pain as prices continue to increase. With many businesses unable to withstand the coming shocks unaided, and the resulting potential for job losses, governments will have no option but to step in with relief.

European leaders are acutely aware that they are financing the enemy at their gates. They must remain united, and coordinate and accelerate the clean-energy transition — action that will be required if they are to achieve the goal set out in the Paris climate agreement of limiting global warming to 1.5 °C above pre-industrial temperatures.

In the short term, the need for energy security will probably see more power than usual generated using fossil fuels, but the overall message cannot now be faulted: European leaders must understand that decarbonization is the answer to both energy and climate security. And if they manage to lay the groundwork for a cleaner future as part of their response to the war in Ukraine, theirs will be a lesson for the world.

Time to recognize authorship of open data

The open-data revolution won't happen unless the research system values the sharing of data as much as authorship of papers.

At times, it seems there's an unstoppable momentum towards the principle that data sets should be made widely available for research purposes (also called open data). Research funders all over the world are endorsing the open data-management standards known as the FAIR principles (which ensure data are findable, accessible, interoperable and reusable). Journals are increasingly asking authors to make the underlying data behind papers accessible to their peers. Data sets are accompanied by a digital object identifier (DOI) so they can be easily found. And this citability helps researchers to get credit for the data they generate.

But reality sometimes tells a different story. The world's systems for evaluating science do not (yet) value openly shared data in the same way that they value outputs such as journal articles or books. Funders and research leaders who design these systems accept that there are many kinds of scientific output, but many reject the idea that there is a hierarchy among them.

In practice, those in powerful positions in science tend not to regard open data sets in the same way as publications when it comes to making hiring and promotion decisions or awarding memberships to important committees, or in national evaluation systems. The open-data revolution will stall unless this changes.

> **"Crediting all those who contribute their knowledge to a research output is a cornerstone of science."**

This week, Richard Bethlehem at the University of Cambridge, UK, and Jakob Seidlitz at the University of Pennsylvania in Philadelphia and their colleagues publish research describing brain development 'charts' (R. A. I. Bethlehem *et al. Nature* https://doi.org/10.1038/s41586-022-04554-y; 2022). These are analogous to the charts that record height and weight over the course of a person's life, which researchers and clinicians can access.

This work has never been done on such a scale: typically in neuroscience, studies are based on relatively small data sets. To create a more globally representative sample, the researchers aggregated some 120,000 magnetic resonance imaging scans from more than 100 studies. Not all the data sets were originally available for the researchers to use. In some cases, for example, formal data-access agreements constrained how data could be shared.

Some of the scientists whose data were originally proprietary became active co-authors on the paper. By contrast, researchers whose data were accessible from the start are credited in the paper's citations and acknowledgements, as is the convention in publishing.

Such a practice is neither new nor confined to a specific field. But the result tends to be the same: that authors of openly shared data sets are at risk of not being given credit in a way that counts towards promotion or tenure, whereas those who are named as authors on the publication are more likely to reap benefits that advance their careers.

Such a situation is understandable as long as authorship on a publication is the main way of getting credit for a scientific contribution. But if open data were formally recognized in the same way as research articles in evaluation, hiring and promotion processes, research groups would lose at least one incentive for keeping their data sets closed.

Universities, research groups, funding agencies and publishers should, together, start to consider how they could better recognize open data in their evaluation systems. They need to ask: how can those who have gone the extra mile on open data be credited appropriately?

There will always be instances in which researchers cannot be given access to human data. Data from infants, for example, are highly sensitive and need to pass stringent privacy and other tests. Moreover, making data sets accessible takes time and funding that researchers don't always have. And researchers in low- and middle-income countries have concerns that their data could be used by researchers or businesses in high-income countries in ways that they have not consented to.

But crediting all those who contribute their knowledge to a research output is a cornerstone of science. The prevailing convention — whereby those who make their data open for researchers to use make do with acknowledgement and a citation — needs a rethink. As long as authorship on a paper is significantly more valued than data generation, this will disincentivize making data sets open. The sooner we change this, the better.