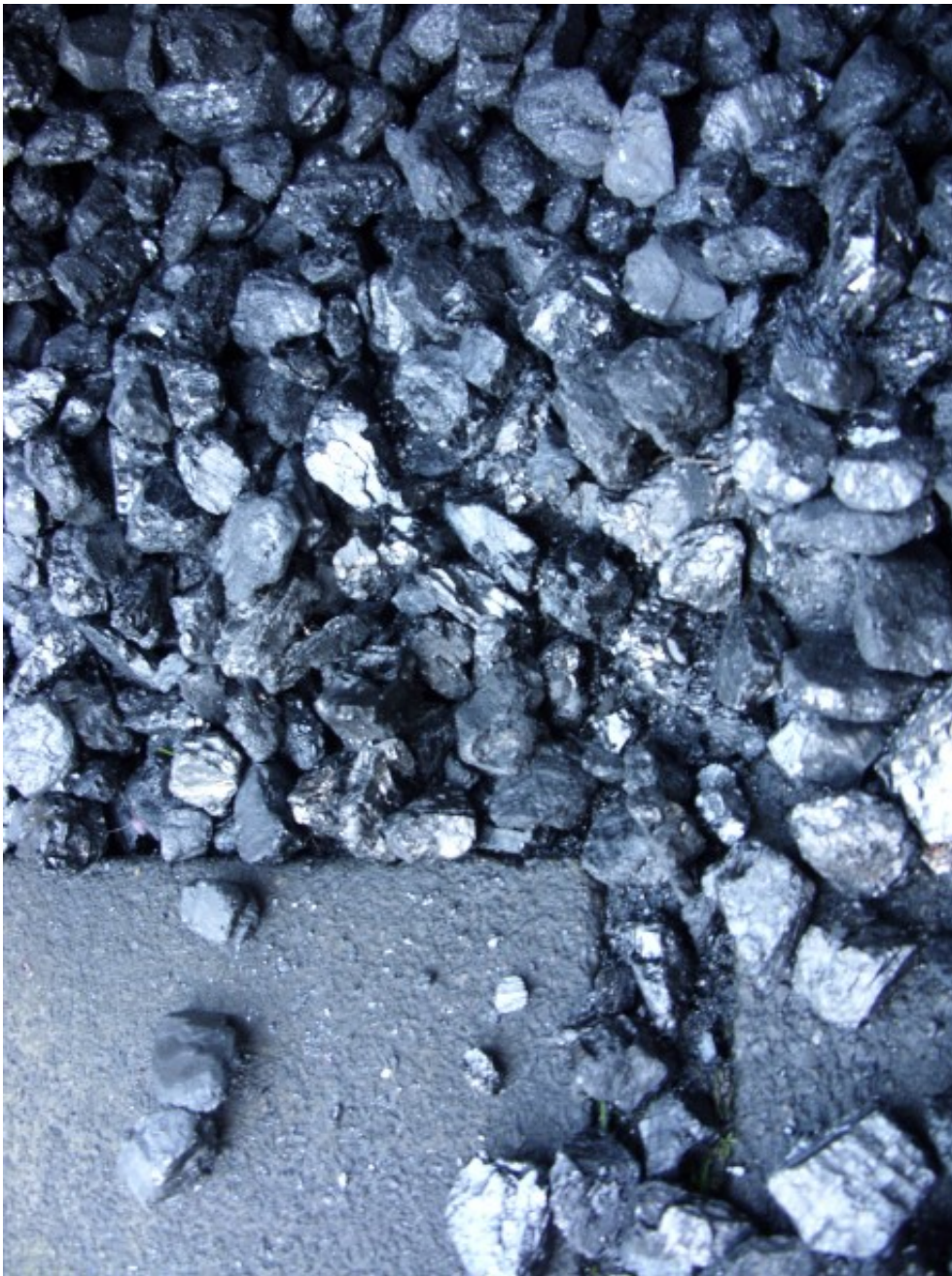


Global carbon emissions could be cut three percent by following the UK's example

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Credit: Grant Wilson/public domain

The UK cut its emissions from electricity production by 25% in 2016, using a strategy many countries could adopt to quickly lower carbon emissions.

The UK achieved an unprecedented drop in [carbon emissions](#) in 2016 by making full use of [natural gas](#) over [coal](#). Changes in the way electricity is generated meant the average Briton saved 400 kg of carbon dioxide - equivalent to taking 1 in 3 of the country's cars off the road.

This saving came from using natural gas in preference to coal in [power stations](#). Natural gas produces less than half the carbon dioxide of coal when burned. The UK has switched off many of its older coal plants, and government policy means it is now cheaper to burn gas than coal.

A new report published today by researchers from Imperial College London and the University of Sheffield shows that global carbon emissions could be cut by one gigatonne per year (3% of global emissions) in less than five years if other countries followed the same strategy.

Crucially, the strategy does not rely on building new gas infrastructure or increasing supply; only using existing infrastructure to its full capacity.

Co-author of the new report, Dr Iain Staffell from the Centre for Environmental Policy at Imperial, said: "Switching from coal to gas is not a long-term solution, but it is an important step to start reducing emissions quickly and at minimal cost. This will give us time to build up the required renewable energy capacity to permanently cut [global carbon](#)

[emissions.](#)"

Co-author Dr Grant Wilson, from Energy2050 at the University of Sheffield, said: "Having a longer-term view, it is likely to prove vastly cheaper not to emit a tonne of CO₂ into the atmosphere over the near-term, rather than to have to take it back out of the atmosphere after 2050.

"This is especially the case if the infrastructure has already been built but is underutilised. This report suggests that the option of fuel switching in the power sector deserves greater consideration to reduce emissions."

The study found that the UK's success was based partly on having the capacity and supply chain available to allow the switch from coal to gas, but that the government's carbon pricing policy was the biggest driver.

In the UK, carbon pricing - charging those who emit carbon dioxide - has become much stronger in recent years, making it more profitable for power companies to use natural gas generation rather than coal. This is helping the UK meet its commitment to be the world's first country to transition completely from coal generation by 2025, and to keep its [coal resources](#) unburnt in the ground.

The researchers looked at the 30 largest coal consuming countries to see if these savings could be mirrored abroad. Initial top-level analysis based purely on existing underused capacity, without building new infrastructure, they estimate that annual emissions could fall by 0.8-1.2 gigatonnes of carbon dioxide if natural gas was burned in preference to coal.

Dr Staffell said: "To avoid the worst impacts of climate change we cannot afford to build new fossil-fuel power stations. Building high-carbon infrastructure, such as new gas power plants, is at least a 30-year

commitment, which will further lock countries into dependence on carbon.

"The UK is leading by example. In the last year all new power stations were renewable; powered by the wind and sun. With the cost of these new technologies coming down rapidly, the economic case for eliminating carbon-based electricity is very strong, but there are still difficult political issues to tackle."

Several countries in Europe have committed to phasing out coal in the next ten years, including the UK, France, Italy, Sweden and Austria. The report finds these countries all have the technical potential to swap all their coal with existing gas power stations, meaning their pledges could become a reality soon.

The report examined some of the largest coal consuming countries in more detail, to assess the reality of such a global switch. Germany, alongside the UK, has been a leader in developing renewable energy. The continued reliance on coal and lignite, however, means Germany has failed to reduce its carbon emissions, and is due miss its 2020 carbon targets.

The analysis shows that while the existing infrastructure in Germany could support rapid switching from coal to gas, there is a lack of political will to switch from coal to gas imports. Importing gas from Russia poses security risks for the country, and the government is unwilling to take unpopular decisions to shut down German coal mines and threaten jobs.

Coal was a major talking point in the last US election, as for years American coal mines had been in decline. The USA is gradually switching from coal to gas as low gas prices make it favourable to burn, and it could make stronger use of particularly cheap gas since a great deal is produced within the country, but political will at present is still

focused on retaining the use of coal.

Although the potential for emissions reductions is great, there are several problems countries may face in switching from coal to gas. For many countries it would require an increased dependency on gas imports, which raises concerns about energy security.

Although natural gas releases less [carbon](#) dioxide when burned, there is a concern about the possibility of leakages along the supply chain. Since methane, the main molecule in natural gas, is a stronger greenhouse gas than [carbon dioxide](#), these leakages may contribute significantly to the greenhouse effect and climate change.

Dr Staffell said: "Fuel switching is no silver bullet, but any opportunity to reduce emissions in years rather than decades deserves attention."

'Rapid fuel switching from coal to natural gas through effective [carbon pricing](#)' is published in *Nature Energy*.

More information: Rapid fuel switching from coal to natural gas through effective carbon pricing, *Nature Energy* (2018).
[nature.com/articles/doi:10.1038/s41560-018-0109-0](https://www.nature.com/articles/doi:10.1038/s41560-018-0109-0)

Provided by Imperial College London

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