

A dirty business



The argument that a new coal mine is needed to support UK steel production doesn't hold water, says **Quintin Rayer**

Environmental groups are opposing plans for a new coal mine at Whitehaven, Cumbria. The mine was initially approved by Cumbria County Council in October 2020, then reconsidered, and is now subject to a public inquiry.

The plans show a tragic lack of climate ambition – and the counter-arguments that steel manufacturing requires coking coal are weaker than they seem.

Steel manufacture

The coal used in steel manufacture is of higher purity than the coal used in energy generation, as the coke produced is nearly pure carbon. In steel production, coke has three roles:

- As a reducing agent to remove oxygen from iron ore (Fe_2O_3). A coke-free approach uses hydrogen to produce 'direct reduced iron', following the reaction $\text{Fe}_2\text{O}_3 + 3\text{H}_2 \rightarrow 2\text{Fe} + 3\text{H}_2\text{O}$. Hydrogen is more expensive, but the electrolysis of water using renewable electricity can ensure it is low carbon.
- Coke combustion heats the blast furnace. However, electric arc furnaces already exist, and renewable energy can power these.
- Steel requires added carbon for the correct alloy. Any source is sufficient, including sustainably managed wood.

Coke, therefore, is not needed to manufacture new steel. There is also the fact that steel can be readily recycled.

New UK coal and COP26

The mine could damage the UK's presidency of COP26, being held in Glasgow in November. In February, James Hansen, a former NASA researcher on global warming, wrote to Boris Johnson urging him to halt the mine. He remarked that the UK's emissions progress was to be congratulated, but warned the mine could damage UK leadership. Greta Thunberg has said it means UK pledges to reach net-zero by 2050 mean nothing.

Climate economics

Low-carbon steel manufacture would be more expensive – but coke combustion has costs that operators externalise by dumping carbon dioxide into the atmosphere. A study of the 2017 north Atlantic hurricane season attributed five-sixths of that year's damages – amounting to 1-2% of the combined value of seven major carbon extraction companies – to human-generated climate change. And this was one type of weather in one locality in one year.

To meet the UK's 2050 net-zero target, the Climate Change Committee (CCC) has said the UK steel industry needs to

be using clean technologies by 2035 – but the Whitehaven mine had consent for use until 2049. CCC chair Lord Deben wrote to planning minister Robert Jenrick to warn that the mine would increase UK emissions by 0.4m tonnes of carbon dioxide equivalent per year – greater than the annual emissions level projected for all open coal mines to 2050 (bit.ly/3eITREC). He also said it would "commit the UK to emissions from coking coal, for which there may be no domestic use after 2035".

According to local mayor Mike Starkie, opposition to the mine has provoked anger. He believes local people support it as it would "underpin an economic revitalisation" by providing jobs.

In March, Cumbria County Council announced it would reconsider the mine's approval, resulting in West Cumbria Mining seeking a judicial review; the government announced a public inquiry, and Mr Jenrick noted that the application raised issues of "more than local importance". The inquiry is scheduled for 7 September, and ministers will have the final decision following its recommendation.

Intergenerational injustice

The economic inconvenience of forgoing coal extraction will prove insignificant compared with the climate change consequences. The 'business as usual' approach shifts the burden onto future generations and is morally wrong. We must now make necessity the mother of invention. 📌

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