



# UCL

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**To whom it may concern**

BY EMAIL

**The economics of coal and steel, as relating to the proposal for a mine at Woodhouse Colliery, Cumbria**

I previously offered my expert opinion on the planning application for a coal mine at Woodhouse Colliery, Cumbria by letter of 5 December 2019.

I have now been asked to offer my expert opinion in relation to a report by Executive Director, Economy and Infrastructure of the Cumbria County Council (“the Council”) in advance of a 2 October 2020 meeting of the Council’s Development Control and Regulation Committee.

I have been asked to consider the Report, and certain materials on which it has based its conclusions in relation to the greenhouse gas impacts of the proposed coal mine and indicate whether these change the opinions offered in my previous letter or constitute evidence of “one or more rare features . . . which override normal economic forces” which I referred to therein.

In short, my conclusions are that none of the evidence provided alters my conclusions that the proposed coal mine is likely to result in considerable additional global carbon emissions and to hamper the development and deployment of low-carbon technologies in the steel industry.

The economic rationale in the Report for the claim that normal economic forces would be displaced so that new coal supply from the Woodhouse Colliery would be offset on a perfect one-for-one tonne basis by supply reductions elsewhere (which I refer to as the ‘perfect substitution’ assumption) is not entirely clear. Whilst a number of factors are raised which are said to support a conclusion that the perfect substitution assumption is valid, it is never explained precisely why these factors should lead to perfect substitution.

In contradiction to the vague arguments in the Report, I would note that:

- 1) The Report indicates acceptance of the applicant’s assertions that “demand for steel is driven by demand in the wider economy” (§ 7.18) and that “the competitive pricing of Cumbrian coal compared to its US equivalent will have no impact on the price of steel, because metallurgical coal is just one of a number of ingredients in the steel making process”. (§ 7.22) The claim here appears to be that larger economic factors drive steel demand, rather than the availability or price of coking coal.

Elsewhere Dr Bristow states the argument clearly, asserting that the production of coal by WCM is unlikely to affect steel supply or demand because “there are many variable components in steel production, and because steel consumption is driven by demand for it from the market (rather than its availability or price).” The latter part of this statement by Dr Bristow is obviously wrong. Of course steel consumption will be affected by macroeconomic factors, as with any product, but it is nonsensical to assert that demand for steel is not affected by its availability nor by its price. Clearly if the price of steel were to increase, this would cause buyers to purchase less (economists refer to this as ‘the law of demand’ and it is one of relatively few points of consensus among economists about goods, including steel), both because some projects would become uneconomic and because alternative materials could be identified in at least some instances.

This same fallacy undermines the Council’s own conclusions. The Council accepts the idea that because there are a number of inputs to steel production which may vary in price, the price of a single input (metallurgical coal, in this case) will not affect the price of the end product. (§ 7.22). Again, this is incorrect – outputs obviously reflect the prices of inputs. Whilst the prices of other inputs may well vary, it is contrary to basic economic orthodoxy to argue that a cost reduction of a key input to high-carbon steel production (i.e. using metallurgical coal) will not lead to any change in the price of the steel produced. It is likewise ‘economics 101’ that if the price of steel is reduced, the amount supplied to the market will increase, because there will be new buyers that are willing to purchase steel at the slightly-lower price.

- 2) It is important to appreciate that the price differences discussed above need not be large to affect behaviour. Even a small local price difference for a major input such as metallurgical coal is likely to lead steel mills (which are often operating at low margins) to increase or decrease production. A reduction in coal prices also makes steel produced by low-carbon technologies less competitive.

Furthermore, when UK and EU steel producers are considering whether to convert to alternative lower-carbon technologies or to instead continue to produce steel using coal, the existence of a significant, stable, long-term supply of lower-priced metallurgical coal is clearly likely to affect this decision-making, inhibiting the switch to lower-GHG-producing methods.<sup>1</sup> Thus, this mine is likely to have further ‘lock-in effects’ which discourage investment in low-carbon steel making technologies, even beyond the impacts discussed above.

- 3) The Report itself (and many of the documents on which it founds its conclusions) appears to accept that there will be price differences.

For instance, the Report states that it is considered likely that Whitehaven Coal “the Cumbrian HVA coal would be at a competitive advantage over US coal in the European market”. (§ 7.86, my emphasis) This must mean that, compared with a US coal of similar quality, there are *cost savings* to using Cumbrian Coal (whether they be because of the actual price at which it is supplied or other factors such as the lack of interruption in supply that would make the coal more attractive and lead to reduced costs for steel producers).

Dr Bristow, for the applicant, likewise states that in his judgment Cumbrian coal will be “significantly cheaper, much more readily available, [and have] better

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<sup>1</sup> For instance, a long-term, low-cost and stable supply of coking coal is likely to influence whether steel producers make the outlay to re-line a blast furnace, prolonging high-carbon steel production at that facility for decades, potentially, or instead to direct those capital investments towards lower-carbon technologies.

retained quality due to shorter shipping distances.”<sup>2</sup> Elsewhere he states that the operating costs of the Whitehaven mine will be “much lower than the majority of other mines producing HCC coal and this cost advantage is of significant interest to steel makers.”<sup>3</sup> Likewise, Wardell Armstrong, for the Council, conclude that “the price of the coal delivered from WCM into the UK and EU markets should have a significant advantage ...”<sup>4</sup>

The Report therefore essentially accepts that there will be a reduced cost to the metallurgical coal from the mine. It proceeds to state that “This proposed development would contribute a tiny fraction of global coking coal supply at maximum output, and so I would agree with the view of UK Steel that this mine itself would be unlikely to significantly impact on the price of coking coal.” (§ 7.83, my emphasis) UK Steel, which the Report approvingly cites above, is quoted two paragraphs earlier as stating that “whilst an increase in coal production will naturally reduce prices, this mine in and of itself would not impact prices to any significant extent. However, they consider that having a new source of domestic coking coal could result in a small reduction in delivered prices for UK producers ...” (§ 7.81, my emphasis) It therefore appears clear that it is accepted by the Council that there will be some price difference.

Similarly, the Report goes on to say that “There is very good evidence to suggest that the opening of a new mine would not materially impact on the demand for steel.” However, what is ‘material’ to steel markets is *not* the proper question. Precisely because there are many variable-cost inputs to steel production, a change in prices may not be obvious to many observers, but that does not mean that behaviour has not been affected. A few pence per tonne may be enough to influence a large-scale purchaser to switch an order from low- to high-carbon steel, for instance, or to use more steel in its next project instead of alternative construction materials.

- 4) In essence, the Report appears to conclude that whilst coal from the Woodhouse Colliery will be cheaper, it will not be so much cheaper as to affect “global metallurgical coal prices.” However, first, it must be noted there is, in reality, no such thing as a single “global” metallurgical coal price. There are prices which are agreed between buyers and sellers of metallurgical coal all over the world. If the price demanded in one area rises significantly above those in others, it may become economical to transport coal from elsewhere, and so prices are unlikely to diverge significantly beyond these transport costs. So it is certainly the case that the price of coal in other parts of the globe may affect the price in any particular location. But additional supply need not affect ‘global metallurgical coal prices’ writ large in order to affect behaviour. Here, supply of metallurgical coal in the UK and certain other EU countries of the magnitude proposed is essentially certain to affect the cost of metallurgical coal *in these locations*. This in turn will have an effect on the decisions of steel producers, including how much steel is produced and how much of this production is via higher- and lower-carbon

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<sup>2</sup> Appendix 1 to Amended ES Chapter 19: Evidence of Dr Neil Bristow, at page 25. (my emphasis) Elsewhere Dr Bristow describes Cumbrian coal as “significantly more cost-competitive to the equivalent grade of coal from the east coast of the USA, or anywhere else in the world, primarily due to significantly reduced shipping costs.” Ibid. at page 26. See also page 23, where the phrase “significantly more cost-competitive” is also used. Both of these are clearly euphemisms for “significantly cheaper.” WCM likewise state that their “coal would be competitive on cost, when compared with an equivalent grade of coal from the USA” acknowledging the price difference. ES Chapter 19 para 45.

<sup>3</sup> Ibid. page 23 (my emphasis).

<sup>4</sup> Wardell Armstrong report at 9.1.6.



the cost of the 'inputs' into steel production including metallurgical coal prices.<sup>8</sup> These sections may simply represent unfortunate wording, but they do appear to raise questions about whether the author of the Report has understood the evidence provided to the Council.

Furthermore, the Council has neglected to address (other than by bare assertion in paragraph 7.301) the impact of lower-cost coking coal on the economics that underpin decisions to move to lower-carbon methods of steel production. As discussed in my previous letter and above at items 2 and 6, one of the effects of opening the Woodhouse Colliery would be to discourage the conversion to lower-carbon steel making technologies.

### **Conclusion**

In short, on the applicant's own admission, the Whitehaven mine would produce lower-cost metallurgical coal. This will add to the global supply of coal, which will put downward pressure on coal prices. With coal a major input into steel production, this will reduce steel prices. This will encourage further demand for high-carbon steel. It will also impede the development of low-carbon steel, which is the only long-term route to the decarbonisation of the sector, as demanded by the net-zero carbon emissions by 2050 to which the UK is legally committed. This is basic economics.

Nothing in the Report or the evidence it cites has therefore changed the conclusions set out in my previous letter. I conclude that there is no basis for claims asserting that the significant coal production from the Woodhouse Colliery would be 'carbon neutral'. On the contrary, I would expect the coal produced from the mine to result in considerable additional global greenhouse gas emissions and make it more difficult for the UK to meet its carbon reduction targets.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Paul Ekins', with a long horizontal stroke extending to the right.

Professor Paul Ekins OBE  
Professor of Resources and Environmental Policy  
Director, UCL Institute for Sustainable Resources

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<sup>8</sup> Separately, I would note in relation to these two paragraphs that it is very surprising that the author believes any conclusions can be drawn from the appended graphs. The fact that the global production of steel and coking coal have historically been correlated is a logical result of the fact that until relatively recently the vast majority of global steel production has required the use of coking coal. The idea that the second graph somehow disproves "that decreasing HCC prices result in increasing steel production and vice versa" is also non-sensical. Of course many factors play a role in both the level of steel production and the price of coking coal and one would not expect to see a clear correlation in a simple graph of this kind, which would only be identified through more sophisticated econometric tools such as regression analysis. (This is quite apart from the fact that the graph appears designed to preclude any visual correlation appearing, as (1) there appears to be only one data point annually for each variable and (2) the variation in coking coal prices is impossible to discern in most years because the scale at which HCC price is graphed is inappropriate, being highly compressed near the axis.)