

## Steel without coal – letter to Westmorland Gazette July 2020 [this version has added notes with links]

Two letters in the 18 June issue and others before, repeated the myth that steel cannot be made without coal, when they criticized Extinction Rebellion (XR) and other protestors against the coal mine proposed by WCM at Whitehaven. XR gained their knowledge about steel-making from investigations by people including myself, who have collated facts from the steel industry and associated research bodies, and also University researchers into the decarbonisation of the steel industry:

Natural gas has been used for years over the world as an alternative to coal to provide gas to reduce iron ore to iron using the Direct Reduced Iron process (DRI)<sup>i</sup>. Also, Electric Arc Furnaces (EAFs), which don't need coal, produce steel from scrap (as well as from DRI), and there is much scope for recycled steel to be of better quality if contaminants such as copper are removed beforehand<sup>ii</sup>.

The steel industry is determined to decarbonise its steel-making by 2050, with for example SSAB planning to reduce its emissions in Sweden "by 25% in 2025"<sup>iii</sup>, and ArcelorMittal in Europe "by 30% by 2030"<sup>iv</sup>. Green hydrogen produced using renewable energy<sup>1</sup> will replace coal as iron ore reducing agent in many cases, and fossil-free H-DRI plants are planned to become commercial from 2025<sup>v</sup>.

This aim is backed by the EU and governments, including the UK, and will mean significant reductions in coal use in Europe for steel-making starting around 2025, and followed by likely major drops in the 2030's. The UK can produce most or all of its steel using EAFs well before 2050, both from UK scrap (now mostly exported) and from H-DRI (imported or otherwise), or from other non-coal methods.

WCM are thus very wrong in claiming that the big shift to coal-free steel-making won't happen within the 50 year lifetime of the mine<sup>vi</sup>. My sources can be checked here<sup>2</sup>: [bit.ly/steelnews](https://bit.ly/steelnews)

Steel-making can and must shift away from using coal, for the UK and EU to comply with the 2015 Paris Climate Accord temperature goals, which include "pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels". You will see from charts of global temperature change that we are likely to hit +1.5 degrees C around 2030 if not before<sup>3</sup>. This is two decades before UK's NetZero 2050 target, meaning the latter is too late. XR already knows this, but supporters of the mine ignore these facts about climate (and steel). Thus XR is correct in its 'Heads in Sand' implications.

Note that any claimed "emissions savings" from shorter transport distances for the coal would only be a tiny percentage of the end-use emissions of that coal – which at 8.5<sup>4</sup> million tonnes CO<sub>2</sub>e per year would be huge and non-compliant with the Paris temperature goals.

Dr Henry Adams, Kendal

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<sup>1</sup> Electricity from renewables such as wind and solar can be used to electrolyse water to produce hydrogen. If produced this way the product is 'green hydrogen'. This converts to water in the H-DR process, with no carbon emissions. 'Grey hydrogen' is produced from methane with CO<sub>2</sub> emissions; if CCS added then it is 'blue hydrogen'.

<sup>2</sup> The most powerful report showing that WCM is incorrect in its timeline is the MPI report commissioned by SLACctt, and is linked to in [www.bit.ly/steelnews](https://www.bit.ly/steelnews) (MPI = Materials Processing Institute [research part of UK steel industry]).

<sup>3</sup> And climate scientist Joelle Gergis writes: "The scientists show that this revision now means that 2°C of global warming is likely to be reached sometime around 2040 based on our current high-emissions trajectory." <https://www.themonthly.com.au/issue/2020/july/1593525600/jo-ille-gergis/witnessing-unthinkable#mtr> (and this corresponds to 1.5 being reached around 2025 on Greg Jericho's chart in The Guardian in his worst of 3 linear extrapolations).

<sup>4</sup> 8.5 using BEIS 2018 conversion factor. The 2020 BEIS CF has increased by 5%, thus upping these emissions to 9.0

i Search under MIDREX – the company that has built numerous natural gas DRI plants (NG-DRI) as well as syngas DRI plants.

ii May 2019 [Steel Arising](#) (pdf) Professor Julian Allwood and his Use Less group show in this report how UK's steel industry can decarbonise e.g. by upcycling the recycling of scrap steel instead of exporting it, and using less steel. <https://www.uselessgroup.org/outreach/publications/reports/steel-arising>

iii SSAB on Hybrit: <https://www.ssab.com/company/sustainability/sustainable-operations/hybrit>

iv **ArcelorMittal: Climate Action in Europe – Our carbon emissions reduction roadmap: 30% by 2030 and carbon neutral by 2050** (pdf). Note that Lund University scientist Valentin Vogl tweets @valenvogl #CCS in steel is back with @ArcelorMittal's recent announcement. the plan: CCU + CCS + biomass use to produce carbon-neutral steel. as with all #CCU one should pay careful attention to "creative emission accounting" 26jun20.

v E.g. **SSAB, LKAB and Vattenfall one step closer to production of fossil-free steel on an industrial scale** – SSAB press release 1/6/20 <https://www.ssab.com/news/2020/06/ssab-lkab-and-vattenfall-one-step-closer-to-production-of-fossilfree-steel-on-an-industrial-scale>

& e.g. "**ArcelorMittal Hamburg's hydrogen project**: We are in the design and funding phase of an industrial-scale project to use hydrogen instead of natural gas in the direct reduction of iron ore (DRI). The objective is to reach industrial commercial maturity of the technology by the mid-2020s, initially producing 100,000 tonnes of sponge iron a year." ibid

vi "The ETC is confident that a complete decarbonization of the steelmaking industry is achievable by mid-century" **MISSION POSSIBLE REACHING NET-ZERO CARBON EMISSIONS FROM HARDER-TO-ABATE SECTORS BY MID-CENTURY – SECTORAL FOCUS: STEEL** - The Energy Transitions Commission (ETC) 2018

[http://www.energy-transitions.org/sites/default/files/ETC%20sectoral%20focus%20-%20Steel final.pdf](http://www.energy-transitions.org/sites/default/files/ETC%20sectoral%20focus%20-%20Steel%20final.pdf)

The ETC, co-chaired by Lord Adair Turner, has a big industry input including from the steel sector, as well as academics *Compare this with WCM's May 2020 Planning Statement R22:*

"Emerging technologies are capable of producing steel without metallurgical coal. However these technologies are in their infancy and, as Dr Bristow explains, will not replace blast furnace steel production as the primary process for steel production for the foreseeable future, and indeed for the proposed life of the planning permission."

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The letter appeared in the Westmorland Gazette in the 9 July 2020 issue (photo by Janet Clarke) (shown larger on next page)



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ndreds of

climate change.  
Although the Earth's climate has  
changed throughout history (in the  
last 650,000 years there has been

forward fresh ideas for combatting  
climate change in south Cumbria.  
As we reveal on page two,  
Ambleside Action For a Future

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disagree with

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when so many of us are be-  
reft and grieving, unable to  
put any of those wishes into  
action.

Sincerely,

**Judith Blaydes**  
**Castle Bailey**  
**Beast Banks**

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**Dr Henry Adams**  
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