

**Email by Henry Adams to Paul Haggin and Angela Jones on 8 March 2021:
WCM - New evidence that must be considered: on steel decarb timeline
especially H-DRI production capacity by 2030**

The email is on page 2. It is worthwhile first reading the following extracts of text to CumbriaCC from their commissioned consultant Wardell Armstrong (who also advises to mining and other companies), with particular focus on the highlighted text. Then compare this with the evidence on the following pages.

Extract from [AUGUST 2020 report \(issued September\) by Wardell Armstrong](#) for CumbriaCC:

9.1.5 Assuming the quality is acceptable WA considers that coal could be sold and would be a direct substitute for imported high vol coals from the USA. This is because the volume of coking coal sold is directly related to the tonnes of steel being produced via the BF/BOF process which it is predicted will remain approximately the same as today. That is unless another process to replace BF/BOF is developed to be a commercial alternative.

9.1.6 In respect of likelihood of substitution, the price of the coal delivered from WCM into the UK and EU markets should have a significant advantage due to the distance over which it is being delivered compared with shipping from the USA.

9.1.7 Current research indicates that the substitution of coking coal could be technically possible and would be better for the environment. ...

...

9.1.10 WA consider that the timescales for project development in both Germany and Sweden is feasible. These projects indicate having a commercially viable demonstration plant by 2035 but that does not mean that all BF's will be able to be scrapped within the EU and immediately replaced. ...

...

9.1.11 Therefore, WA believe that it could be 2050 at least before any significant inroads are made to the volumes of coking coal being used and even then, some plants will still be using coking coal.

Extract from [22sep20 letter from WA to Paul Haggin](#):

Email from Wardell Armstrong.pdf

3. From my researches , it is indicated that the tonnes of steel produced by the BF route is likely to remain the same until 2050, even taking into account an increase in the volume of new steel being produced by EAF from scrap (using no coking coal). Assuming no alternative to a BF is found for producing steel in the meantime , the same tonnes of steel produced by BF will require the same tonnes of coke and hence the same tonnes of coking coal from any source . As a result, the tonnage of any coal that is sold into the UK or EU market by WCM has to substitute the same tonnage of coal imported from the USA.

Best regards

Robin

Robin Dean | Technical Director

Wardell Armstrong LLP

[CumbriaCC source location: Under 'Committee Documents' tab](#)

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My 8mar21 email is on the next page

The table is an early draft and I've appended the latest version

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Subject:WCM - New evidence that must be considered: on steel decarb timeline especially H-DRI production capacity by 2030
Date: Mon, 8 Mar 2021 16:58:59 +0000
From: Henry Adams <henryadams@dragonfly1.plus.com>
To: Paul Haggin <paul.haggin@cumbria.gov.uk>, angela.jones@cumbria.gov.uk

Dear Paul and Angela, **URGENT**

WCM - New evidence that must be considered: on steel decarb timeline especially H-DRI production capacity by 2030

I am currently writing a preliminary report on the latest evidence on **steel industry targets for decarbonisation** and especially the **construction of H-DRI plants with production capacity that is on a commercial scale by 2030**.

Because in the rushed circumstances I feel it is very urgent that you can get an idea of the importance of this evidence that will be sent to the Cumbria County Council this week I am showing here a **draft** table that will be in the report - before it has reached its final state and been checked by international experts on the subject.

The final version will be at least slightly different (in presentation & detail) but the magnitude of the point being made will be the same: i.e. **that the total production of H-DRI steel will be greater than 10 million tonnes per year over Europe:**

Note that the table is simply a selected sample - and so the sum total of H-DRI production in millions of tonnes coal-free fossil-free steel by 2030 is likely to be higher than as shown.

Also it is just a snapshot for today - because I keep having to update news on H-DRI often several times a month because things are changing so rapidly in this field.

I am expecting this table to be an out-of-date underestimate in several weeks time!

[table on next page]

Table (by HA) summarizing examples of plans for H-DRI plants in Europe

Highlighted = announced since 2oct20. TBA = To be added here &/or to be announced in due course

Company (+ = with other co.s)	Date to start production	Steel production capacity pa (by 2030)	Country	Source	Comments
SSAB+ Hybrit	2025/6	1 Mtpa <small>(from demo plant)</small>	Sweden	31aug20	The pilot plant started production in 2020
H2GS	2024	5 Mtpa by 2030	Sweden	24feb21	H2GS is a new consortium
LKAB <small>(state-owned iron ore co.)</small>	By 2030? TBA	>>>>>>>>>>	Sweden	23nov21	The potential production capacity of H-DRI will be huge by 2035
Arcelor Mittal	2026	3.5 Mtpa	Germany	5mar21	
Thyssenkrupp	2025	400,000 tpa to 3 Mtpa by 2030	Germany	1sep20 28aug20	
Salzgitter SALCOS project	? TBA	TBA (unclear at present)	Germany	10dec20	plan to make green hydrogen and build H-DRI plants this decade
Voestalpine +	? TBA	Initially pilot scale 250,000 tons pa	Austria	11nov19 26jun19	plan to make green hydrogen and build H-DRI plants this decade. With Primetals (part of MHI)
Liberty Steel Group +	Likely to be by 2030	2 Mtpa	Dunkerque France	22feb21	Only at MoU stage at present, and Liberty is having financial problems now. Initially H2+CH4 then 100% H2

TOTAL production capacity: 12.5 to 14.5 Mtpa by 2030 for those targets companies have announced. At lower end of what's possible as some companies prefer not to announce as yet and because the above table does not cover all companies or all site locations where H-DRI plants are planned. For text form of above table see p3.

The Liberty Romania project in the table below would add a further 2.5 Mtpa to the above total of 14.5.

(The above is a screen-grab of part of page 2 of the draft report)

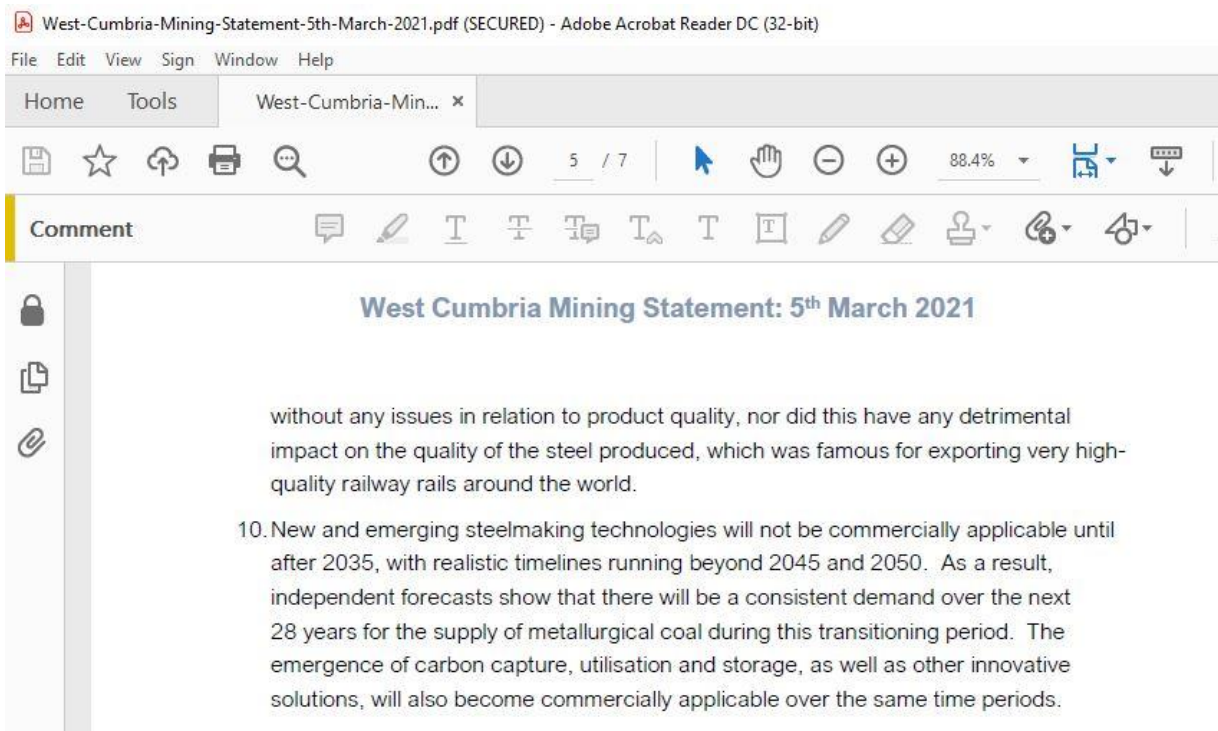
The information comes via my online collation www.bit.ly/steelnews which is continually updated. The 'new evidence' is highlighted.

It is interesting to compare the above evidence with the statement on the same topic by West Cumbria Mining (below), which is more similar to the conclusion that Cumbria County Council made in its Officers Report for the 2oct20 DC&R ctte than to my position last summer.

I hope you now see that the position you came to then is very definitely not tenable (it wasn't tenable back then! - such as regarding SSAB's Hybrit timeline which you were made very well aware of, and well before the hearing).

I hope you also will agree that WCM's statement "10." on the steel decarb timeline is not in the least bit true - it is decades out.

It is not just misinformation - but either disinformation or an extreme blind spot of incompetence on the topic - despite it being highly relevant to the future economic viability of WCM's project.



Now that the Council has got itself trapped in a catch-22 of facing legal action whichever way it goes - the optimum solution appears to be for a public inquiry via a government call-in ...

I hope you also can read my recent brief online blog-post:

[Why the Steel industry doesn't need Cumbria's coal | henryadamsblog \(wordpress.com\)](https://henryadamsblog.wordpress.com/2021/03/01/the-steel-industry-doesnt-need-cumbrias-coal/)
<https://henryadamsblog.wordpress.com/2021/03/01/the-steel-industry-doesnt-need-cumbrias-coal/>

And these 2 brief articles from Lund University and Leeds University steel decarb researchers respectively, which are linked to under 'recommended further reading' in my blogpost:

[Why Europe doesn't need Cumbria's coking coal | Inside track \(greenallianceblog.org.uk\)](#) by Valentin Vogl who has been studying the decarbonisation of steelmaking for several years at Lund University, Sweden.

[Cumbria mine: is there a technical need for new coal mines in the UK? – CREDS](https://www.creds.ac.uk/cumbria-mine-is-there-a-technical-need-for-new-coal-mines-in-the-uk/)
<https://www.creds.ac.uk/cumbria-mine-is-there-a-technical-need-for-new-coal-mines-in-the-uk/>

My present email here is not part of my formal objection as it contains draft information which will be replaced by a more formal email later this week if all goes well.

It is simply to ensure that you are well-informed in time of this evidence - before making decisions as to how you advise the committee on this timeline topic.

You might even find this useful knowledge if you have to defend CumbriaCC against WCM!

The main thing is - that you no longer mis-advise the committee on the timeline for H-DRI production, but instead give an evidence-based assessment.

Yours sincerely,

Henry Adams

Kendal 01539 722158

Updated Spring 2021 version of the draft table emailed to Paul Haggin and Angela Jones:

Not (yet) emailed to Paul Haggin and Angela Jones:

Table (by HA) summarizing examples of plans for H-DRI plants in Europe - Spring 2021 update

Mtpa = million tonnes per annum = Megatonnes per annum

Highlighted = announced since 2oct20. Figure is for i = iron, s = steel

Company (+ = with other co.s)	Date to start production	H-DRI production capacity pa (by 2030)	Country	Source	Comments
HYBRIT: SSAB + LKAB + Vattenfall	2026 i	1.3 Mtpa 2026, to 2.7 Mtpa by 2030	Sweden	31aug20 24mar21	The pilot plant started production in 2020. Demo plant to start 2026, Goal: "to full industrial scale of 2.7 Mt by 2030"
H2GS H2 Green Steel	2024 s	5 Mtpa by 2030	Sweden	24feb21	H2 Green Steel is a new consortium
LKAB (state- owned iron ore co.)	"by 2029" i	I have yet to find a figure by LKAB. Safe to guess c.1.3 by 2030?	Sweden	23nov21 10dec20	The potential production capacity of H-DRI by 2035 is huge. To avoid double-counting with Hybrit I won't add 1.3 to total below.
Arcelor Mittal	2026 s	3.5 Mtpa + 0.1 Mtpa Hamburg	Germany	5mar21 16sep19	Bremen & Eisenhüttenstadt (& Hamburg) Starting with CH4 then to H2.
Thyssenkrupp (at Duisburg)	2025 s	(0.4 Mtpa to) 1.2 Mtpa (aim 3 Mtpa by 2030?)	Germany	1sep20 28aug20	To build a new DR plant capacity 1.2Mtpa (starting at 0.4Mtpa). Aim: 3 Mtpa "climate neutral steel" by 2030. But may use CH4 until sufficient H2.
Salzgitter SALCOS project	By 2030 but H2 & CH4	(100kg/hr but unclear per year)	Germany	10dec20 5jan21	plan to make green hydrogen & also have commissioned Tenova to build H-DRI plant.
Voestalpine +	2021 (pilot) s	Initially pilot scale 0.25 Mtpa	Austria	11nov19 26jun19	plan to make green hydrogen and build H-DRI plants this decade. With Primetals (part of MHI)
Liberty Steel Group +	Likely to be by 2030 i	2 Mtpa	Dunkerque France	22feb21	Only at MoU stage at present, and Liberty is having financial problems now. Initially H2+CH4 then 100% H2
Liberty Galati	2023-2025 i	2.5 Mtpa	Romania	10jun20	NG-DRI to H-DRI as H2 becomes available

TOTAL production capacity: (12.8 to) 17.3 Mtpa by 2030 for those targets companies have announced. (The 12.8 is what the total would be if the 2 Liberty-involved projects don't go ahead due to GFG/Liberty's financial problems.) At lower end of what's possible by 2030 as some companies or steel mills might wish to delay decisions or plans or announcements until later this decade (a DRI plant takes c.3 years to build).

To provide a yardstick for comparison: **17 to 18 Mtpa** is 19%, or **near to a fifth**, of the figure by Eurofer for EU's crude steel production in 2019 in the blast furnace "BOF & other" category (as opposed to the "Electric" (EAF) category. [European Steel in Figures 2020](#) My total is only a rough provisional figure of magnitude¹.

More H-DRI based steel capacity is very likely to be added to this figure by 2030.

And H-DRI is not the only alternative to coal-fed blast furnaces (e.g. increased recycling capacity by more EAFs, increased material efficiency etc).

Examples of targets for CO2 emissions reductions by steel-makers in Europe

SSAB: 25% by 2030 & "fossil-free by 2045" [Timeline for HYBRIT and fossil-free steel – SSAB](#)

LKAB “net-zero ... by 2045” [Historic transformation plan for LKAB: “The biggest thing we in Sweden can do for the climate”](#)

Thyssenkrupp: 30% by 2030 & carbon neutral by 2050

Arcelor Mittal: 30% by 2030 & carbon neutral by 2050 & [to produce ‘green steel’ starting in 2020 LATEST](#)

Voestalpine: “could reduce CO₂ emissions by around a third by 2030” [using green hydrogen & DR](#).

Liberty Steel Group: “[A vision for carbon neutral steel by 2030](#)” [Edie](#) Owner Sanjeev Gupta “came out strongly in support of the UK’s Climate Change Committee last month when it urged the Government to target near zero emissions for steelmaking by 2035” [[Source](#)].

And worldwide:

⌵ Aaron Goater Retweeted

 **Akshat Rathi** ✓
@AkshatRathi

Steel decarbonization goal-setting is speeding up. World’s top four out of five steelmakers have committed to net-zero emissions by 2050 in the last four months.

1.  ArcelorMittal (Sep 30)
2.  Baowu Steel (Jan 21)
3.  Nippon Steel (Dec 10)
5.  POSCO (Dec 16)

9:04 AM · Jan 25, 2021 · Twitter Web App

Relevant people

 **Akshat Rathi** ✓
@AkshatRathi Following

Climate and energy nerd at Bloomberg News. Chemistry PhD, University of Oxford. Writing a book on scaling climate solutions. Newsletter bit.ly/bbg-net-zero

What’s happening

COVID-19 · 4 hours ago

There is ‘no data’ to suggest Oxford University and AstraZeneca’s COVID-19 vaccine is ineffective in older people, says German health ministry

