WCM coal shipping emissions cf combustion emissions

And implications re debate on whether 'add to' or 'replace'/"displace" of global coal supply and associated emissions change – increase or decrease [SPOILER: add to & increase – as expected]

By Henry Adams

	A	B	C	D	E	F	G	H	I	J	K
1	**Shipping emissions**		(date partly from WCM 2018 pdf)								
2											
3	Using same gCO2 per tonne km figures as WCM used (source BEIS)										
4	This table similar to that in WCM pdf:										
5											
6	Shipping route	km	gCO2 per tonne km	CO2 emissions per tonne of coal on each journey							
7	Virginia to Rotterdam	7738	6	46.428	kg	0.046428	tonnes CO2 per tonne coal				
8	Baltimore to Rotterdam	8035	6	48.21	kg	0.04821	tonnes CO2 per tonne coal				
9	Redcar to Rotterdam	668	6	4.008	kg	0.004008	tonnes CO2 per tonne coal				
10	Difference btwn US & UK			43.311	kg						
11	Ratio US to UK:			11.80614	approx 12 times						
12	Ratio UK to US:			0.084702	approx 8.47%						
13											
14	**Now compare with combustion emissions (copied from another spreadsheet)**										
15											
16	Metallurgical (coking) coal combustion emissions (BEIS)			3043.79	kg per tonne	3.04379	tonnes CO2 per tonne coal				
17											
18	"Savings" of emissions as a % of combustion emissions to show how the two compare:										
19				**1.423%**	70.28	times the size of the "savings", at least.					
20					(At least - because I've yet to add the middlings coal emissions a						
21	This shows that the dubious potential "savings" of emissions per tonne of coking coal produced by WCM is only 1.423%										
22	of the size of the combustion emissions of each tonne of WCM coal.										
23	Or to put it another way - the combustion emissions of WCM coal is over 70 times greater than the so-called savings.										
24	And at least over 70 times because I have yet to add the associated middlings coal emissions and upstream emissions other than shipping.										
25											
26	The argument by WCM appears to want the reader to assume that WCM coal will replace a similar amount of US coal.										
27	There is no good evidence for that. The reality is that WCM coal and their emissions will add to US coal and their emissions not replace them.										
28	This is looking at global coal and global coal emissions - as that's what affects global warming potential.										

The argument by WCM appears to want the reader to assume that WCM coal will replace a similar amount of US coal. There is no good evidence for that. The reality is that WCM coal and their emissions will add to US coal and their emissions not replace them. This is looking at global coal and global coal emissions - as that's what affects global warming potential.

Adding to the global coal market will not just add to emissions but is also likely to decrease global coal price per tonne. This would have the knock-on additional bad effect of discouraging transition to a higher use of recycling steel. It would also impact negatively on investor interest in developing lower carbon methods of producing steel - which are ongoing.

So I see no good reason why WCM coal will replace any significant US coal on the global market. BY significant – I mean to reduce carbon emissions:
The importance of the above figure 1.423% is that:
For the "savings" in shipping emissions to have any overall net global CO2 emissions reduction impact, every tonne of WCM coking coal would have to replace (globally), more than (100-1.423)=98.577% of every tonne of US coal produced.
That is an exceedingly unlikely possibility.

<u>If you doubt this, I have done a series of calculations showing example outcomes:</u>

(next page)

41	If you doubt this, I have done a series of calculations showing example outcomes:		
42			
43	Firstly let's make a hypothetical assumption that WCM coal would replace 50% of its weight in US coal:		
44	Addition to global coal emissions is now halved to:	1522	kg CO2 per tonne
45	Transport emissions "saved" per tonne coal:	22	kg CO2 per tonne
46			
47	Now a 90% replacement, 10% addition:		
48	Addition to global coal emissions is now reduced to:	304	kg CO2 per tonne
49	Transport emissions "saved" per tonne coal:	39	kg CO2 per tonne
50			
51	Now a 95% replacement, 5% addition:		
52	Addition to global coal emissions is now reduced to:	152	kg CO2 per tonne
53	Transport emissions "saved" per tonne coal:	41	kg CO2 per tonne
54			
55	Now a 98.577% replacement, 1.423% addition:	***BREAK-EVEN POINT AS EXPECTED:***	
56	Addition to global coal emissions is now reduced to:	43	kg CO2 per tonne
57	Transport emissions "saved" per tonne coal:	43	kg CO2 per tonne
58			
59	Now a 99% replacement, 1% addition:		
60	Addition to global coal emissions is now reduced to:	30	kg CO2 per tonne
61	Transport emissions "saved" per tonne coal:	43	kg CO2 per tonne
62			
63	Now a 100% replacement:		
64	Addition to global coal emissions is now reduced to:	0	kg CO2 per tonne added to global CO2 from coal
65	Transport emissions "saved" per tonne coal:	43.3	kg CO2 per tonne
66			