

BEIS Clean Steel consultation:

<https://beisgovuk.citizenspace.com/heat/creating-a-clean-steel-fund-call-for-evidence/>

BEIS background reading:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/827884/clean-steel-fund-call-for-evidence.pdf

Sandbag submission 20th November

Call for evidence questions

1. The UK steel sector has a number of strengths identified above, are there any others that we have not identified?

Potential future strength is access to large quantities of renewable electricity (and therefore green hydrogen). Also access to known geological storage in North Sea and other UK continental shelf, allowing for hydrogen from steam methane reforming combined with CCS.

2. Are there any further opportunities, not already identified, from a UK clean steel sector?

N/A

3. What other wider benefits could the Fund deliver?

Acceleration of green hydrogen deployment. By providing new large green hydrogen demand sources from steel, the Clean Steel Fund may encourage businesses to invest in green hydrogen production and subsequently drive costs lower. Readily available and low-cost green hydrogen will be a major driver of decarbonisation across the UK economy. Additionally, seeding hydrogen production allows for long-term (interseasonal) energy storage, possibly avoiding need for gas-with-CCS.

Support for UK green hydrogen industry. The UK has a vibrant and growing green hydrogen industry, the Clean Steel Fund may support this industry by stimulating new demand for green hydrogen. Green hydrogen is likely to become a major global commodity over the coming decades, suggesting support for the UK green hydrogen industry will be well placed.

4. How could the UK government facilitate creation of a market for low carbon steel?

The UK government can give a clear signal to the steel industry and investors by committing to a 2030 phase-out date for coal use in steel production. This could work similarly to the coal phase-out in power which opened up the market for clean solutions.

To create the market, the government could mandate, or encourage a voluntary commitment, to an increasing percentage of steel used in the UK that must be coal-free. The

UK's blossoming offshore wind sector can help this transition by committing to construct an increasing proportion of their turbines with this green steel - there may be opportunities to implement a mandatory level through the current CfD framework.

- Normalising the concept of green steel for green energy globally (after an initial demonstration in the UK) would create a large, tangible market for green steel. This would give steel producers the confidence to accelerate their decarbonisation plans to supply this new market.
- The concept should also be replicated with automobile manufacturers: 'green steel for green cars'. This helps guarantee a growing market for steel producers.

5. Have we identified the most significant barriers to investment in decarbonisation of steel production? Are there others we should consider?

N/A

6. How are investment decisions on decarbonisation projects made in your organisation? What evidence is required to support decisions?

N/A

7. What would help your Boards to agree to decarbonisation projects?

N/A

8. Have we correctly identified the objectives for this Fund?

The objective *"To transition to lower carbon steel production through new technologies and processes, placing the sector on a pathway consistent with the UK Climate Change Act (net zero)"* is likely too slow. Aiming for "lower carbon" steel production by 2050 will see the UK outcompeted by the clean steel pilot projects which have already begun on the European continent, including Hybrit in Sweden and Thyssenkrupp in Duisburg. Blast furnaces typically have an investment cycle of 15–20 years: making the switch in 2040 too late. For the UK to retain early-mover advantage with zero-carbon steel technology, a target of coal-free steel by 2030 would seem to be necessary. This would enable the UK to have a global impact in driving clean steel production.

We suggest an additional objective for the Fund should be: *"to ensure deployment of clean steel primary production pilot projects in the early 2020s"*, this will require accelerating the deployment of at least part of the envisaged value of the fund vs. the timescales currently envisaged (fund opening in 2024).

The objective “*To maximise longevity and resilience in the UK steel sector by building on longstanding expertise and skills and harnessing clean growth opportunities*” requires that the UK invest in clean methods of primary steel production, not just steel recycling with electric arc furnaces. For clean growth, and to harness existing steel expertise, the UK needs primary production.

9. How can we maximise broader societal benefits, alongside value for money, in the design of the Fund?

32,000 jobs currently exist in UK steel, and many more are indirectly supported by steel manufacture. It would make economic and social sense to at least retain the two current sites at Scunthorpe and Port Talbot, and transition using the expertise already there. The Humberside site is particularly suited to demonstrating CCS, given the large collection of local energy-intensive manufacturers, power stations and refineries, close to a well-mapped geological storage in the North Sea.

The UK’s commitment to net zero by 2050, alongside commitments by the international community to the Paris Agreement, serve as a huge opportunity to rescue the struggling UK steel sector through a government-supported transition to zero-carbon steel production.

10. What estimates do you have on the costs and availability of these three technology options for reducing emissions?

Most estimates show a small but significant increase in costs for producing steel with clean hydrogen.

The Hybrit pilot project is being constructed for approximately £110m (SEK 1.4bn), with ~one third from the Swedish government and the rest from private partners. A pre-feasibility study was conducted 2016-2017. The conclusion is that fossil-free steel, given today’s price of electricity, coal and cost of CO₂ emissions, would be 20-30% more expensive. With declining prices in electricity from fossil-free sources and increasing costs for CO₂ emissions through the European Union Emissions Trading System (ETS), the pre-feasibility study considers that fossil-free steel will, in future, be able to compete in the market with traditional steel.¹

Arcelor Mittal (in their 2019 Climate Action Report) project larger cost increases for producing steel with renewable hydrogen (+60% to +90%) or with CCS (+35% to +55%).

Materials Economics 2019 report “Industrial Transformation 2050” suggests hydrogen or CCS steel production would increase costs by between 0%-20% (which translates into much smaller cost increases for finished products). The most economic route is strongly influenced by electricity costs, with low electricity costs (below €50/MWh) favouring the hydrogen process.

¹ <https://www.ssab.com/company/sustainability/sustainable-operations/hybrit>

Materials Economics also finds that investment in the steel sector will have to rise by 25% to 65% during the transition - which will require some government support.

11. How does the availability of these technologies align with your refurbishment/replacement cycles?

N/A

12. Are there any other technology options that we should consider? What evidence do you have to support this, including on costs and availability?

13. Are there any additional policies that government should consider to support the steel sector in the shift to decarbonisation pathway?

The government should explore

- Mandating steel used in public procurement has an increasing % from UK green sources (this could be additional to the existing public procurement guidelines which encourage the use of UK steel)
- Mandating a % of wind turbines with government contracts to be made from green steel.
- Mandating a % of automobile steel to come from green sources
- Border carbon adjustments for steel

14. Do you have suggestions on how best we might engage with Industry as we develop the work programme to inform the design of the Clean Steel Fund?

N/A