

Written evidence from Javelin Global Commodities

Introduction

Javelin Global Commodities is a UK Head Quartered global commodity trading company. We operate across 100 countries and six continents with more than 20 different commodities including thermal coal, metallurgical coal, iron ore, steel scrap, hydrocarbons, freight and renewables. Javelin is active in the scrap steel, HBI and other steel products markets globally and has an especially strong presence in developing new markets, new logistic routes, and new solutions for a green steel future.

In 2021 Javelin supplied over 9mt of steelmaking raw materials to the global steel industry, across a range of metallurgical coals, blast furnace coke and iron ores and scrap. The UK is a strategic market for Javelin: our 2021 supply to UK steel industry exceeded 700kt and sales of over \$180m in value.

Javelin prides itself on its in-depth knowledge of best practice in steelmaking and strives to develop new products for steelmakers that create value. Javelin is using its experience and global network of customers and suppliers to be at the forefront of developing green products for the steel industry and has an experienced team dedicated to developing green solutions for our customers, with current focus on sourcing green products and developing the supply chains and manufacturing processes that will give green solutions.

Javelin believes collaborations between Government and markets to support capital deployments are essential for the creation of UK steel decarbonisation pathways. Therefore, we are pleased to participate in this Call to Evidence and set out our answers below.

Javelin Reply to Questions

- The technologies there are to produce “green steel”; how close they are to commercialisation; and the benefits and risks of each

Green steel technologies broadly comprise of four pathways, (i) Biomass, (ii) Carbon Capture, (iii) Electric, and (iv) Hydrogen

- (i) Adopting existing infrastructure, biomass offers an immediate green steel solution where sustainable renewable biomass fuels displace fossil fuels and biocarbon materials displace fossil reductants. The UK is well placed to support this technology pathway with a robust and existing biomass fuels supply chain proven across the power sector. Biocarbon as a reductant is now ready for deployment as a drop-in to existing processes, the supply chain is ready to scale, and environmental audits can leverage the existing biomass sustainability and lifecycle assessment criteria and methodologies. Across other UK innovation programmes there are strong interdependencies with Sustainable Aviation Fuels which could supply the biocarbon as a by-product. Adding BECCS to the process will further enhance the green steel solutions.

Since this pathway adopts existing infrastructure, it represents a low-risk solution providing an immediate transitional and blending with fossil solution, incrementally reducing the fossil carbon footprint.

Biomass as a fuel is proven within the UK. Therefore, it is the development of the biocarbon chain supply which presents the greater risk.

Biocarbon is derived from the treatment of biogenic waste materials using pyrolysis, passing the biogenic material through a high temperature, low oxygen environment. This process creates a char-like substance with a high fixed carbon percentage, matching the different carbon percentages of existing fossil feedstocks to the steel making process. For example, by aiming for an 85% fixed carbon material this resembles an Anthracite. Lower fixed carbons can achieve similar properties to the material used in Pulverised Coal Injection.

Javelin is working closely with a range of technology companies all of whom have successfully piloted their systems. We have been able to provide samples to our clients to test, and these tests are achieving positive results and promising feedback.

The next step is for a UK steelmaker to partner with UK Gov, Javelin, and a biomass producer to install a biochar/syngas production unit next to the steel plant. The biochar would go into steelmaking applications to displace coals and coke and in the future into steel refining applications. The syngas would go into a combination of fuel manufacture and/or use as a heating medium (to displace natural gas). This risks of this pathway are limited, as the outputs are needed for a variety of green future outcomes, including green steel.

- (ii) The UK is well placed to be able to support Carbon Capture clusters and the technologies are becoming increasingly tangible and should be well placed to support net-zero solutions towards 2040 to 2050
 - (iii) Electric Arc Furnace is a known technology where the green steel pathway will be determined by the availability and affordability of renewable power. The UK is well placed to support the electrification of steel with plans to increase offshore wind, onshore wind and solar. It should be noted that this green pathway would be enhanced by the availability of biocarbon supply because carbon is required to be added to the electric arc furnace to give the desired carbon in the final steel product.
 - (iv) Hydrogen is the technology pathway which is the most immature where innovations are progressing through design phases to proof of concept. Encouraging results are being achieved, with the Swedish impact company H2 Green Steel being of most note. Founded in 2020 the company is aiming to produce five million tonnes of green steel annually by 2030. Similar to the Electric Arc Furnace pathway, the availability and affordability of renewable power will be instrumental to both the domestic and imported hydrogen supply chain.
- The relationship between low-carbon steelmaking technologies and the development of other decarbonising technologies
 - (i) Biomass and biocarbon whilst ready for deployment today offer strong synergies with Sustainable Aviation Fuels (SAF), where the biomass supply chain enhances the UK ability to establish a leading position in the production of SAF and the by-products would readily support biocarbon feedstock into all four green steel pathways. Biogenic feedstocks can also be found within the UK waste streams which

create synergies to the circular economies providing sources of both carbon and syngas.

- (ii) BECCS & the wider Carbon Capture policy support the delivery of green steel, but there are particular advantages for the biomass and biocarbon pathway where the biogenic CO₂ will offer the UK options towards carbon negative solutions where the CO₂ is either stored or used in the production of net zero methanol and other fuels.
 - (iii) Electric Arc Furnace is dependent on the continued rollout of renewable power
 - (iv) Hydrogen is dependent on the continued rollout of renewable power and the support incentives to the UK deployment of hydrogen production
- The timescales needed to achieve fossil fuel feedstock replacement and fossil fuel-free energy throughout the supply chain for steel products
 - (i) Biomass and Biocarbon supply chain could be established at scale as early as 2024/25
 - (ii) Carbon Capture will scale 2040/50
 - (iii) Electric Arc technologies are ready for deployment and the UK renewable power deployments should be at scale 2030
 - (iv) Hydrogen is a difficult timescale to predict, modest volumes could be achieved by 2030 with scale being achieved 2040/50

- The targets the Government should set for low-carbon steelmaking in the UK

The UK should aim to drive market disruption and lead green steel production. Increasingly, steel customers across the motor industry and wind industry are setting net-zero targets for their supply chains and the UK can start to address this progressively across the four technology pathways as early as 2024.

A transitional and progressive approach will enable immediate CO₂ reductions supporting 10% reductions in 2024 rising to 100% by 2045

- The policy support for low-carbon steelmaking in the UK provided in the Industrial Decarbonisation Strategy and the Net Zero Strategy.

Grant based funding to support CAPEX combined with the issuance of free UK ETS carbon allowances for each tonne of green biochar (or similar green product) that displaces non-green carbon (such as coal and coke).

Consideration of the role of private finance and how policy can encourage banks to lend to support capex, e.g. government guarantee scheme

- How effective the Clean Steel Fund is expected to be in helping to deliver decarbonised fuel capacity in the UK

This is an effective mechanism to support the deployment of capital

- Any additional policy support required to encourage the transition to low-carbon steelmaking

Support and adopt similar policy measures to the Carbon Border Adjustment Mechanism

Accelerate the end of the issuance of free UK ETS carbon allowances to fossil production and support every tonne of green products produced with an issuance of UK ETS carbon allowance to reward rapid deployment

- The desirability or otherwise of establishing a low-carbon steelmaking pilot at a UK site

The UK should aim to be at the forefront on greener steel and pilot schemes will be essential. The UK is a leader in biomass; 2nd generation sustainable aviation fuel will target woody biomass which in combination makes the UK the ideal hub to host green steel produced via biomass and the by-products of SAF. Combining BECCS with the biomass pathway will also allow the UK to lead the world in the production of methanol to support the decarbonisation of shipping fuels.

The UK is well placed to support 100% renewable EAF. This would use green electricity, scrap and metalics made from iron ore reduced by hydrogen. Biochar would be needed for the steel refining process and surplus syngas would be used in heating application (to displace natural gas)

- The consequences to the UK steel sector from a failure to invest in alternative technologies in a globally competitive market

The consequence would be the end of UK steel production which is already in steep decline. The UK should adopt a proactive disruptor approach and aim to become the world leader in green steel production and should consider adding incentives to the wind and solar developers to ensure their steel is 100% green and produced within the UK.

As we move to a Net Zero, if our steel sector has not reduced its emissions intensity in-line with international markets we will lose customers. Our belief is the more ambitious the government is on low-carbon steelmaking goals the easier it will be to scale them up. Most important of all is clarity in any goals or legislation. Clear and consistent policy will give the confidence to make the significant capital investments which are necessary to transition to lower-carbon steel methods.

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