SUBMISSION TO BEIS COMMITTEE

Liberty Steel and the Future of the UK Steel Industry

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SUMMARY

This document addresses six topics concerning Liberty Steel and the future of the UK steel industry, questions that that were raised in a parliamentary enquiry launched in April 2021.

The report has been prepared by Metals Consulting International Limited (MCI), an independent UK firm of steel industry management consultants, who have many years' experience of restructuring and turnaround in the international iron and steel industry.

We summarise our responses to the six questions as follows.

Q1) What are the current challenges facing the UK steel industry and its long-term viability?

In MCI's view, key challenges facing the UK flat and long product steel industry are improved cost competitiveness and rebuilding of market presence (i.e. increased production volume for the UK). This is especially so in the flat-rolled sector, where hot strip mills at Tata Steel (Port Talbot) and Liberty Steel (Newport) are judged by us to be currently somewhat uncompetitive. In the case of Port Talbot (and British Steel Scunthorpe, which makes steel sections) blast furnace steelmaking using large tonnages of coking coal is responsible for much generation of CO_2. Investment in decarbonisation represents a potential opportunity for long-term competitiveness improvement.

Competitiveness is also an issue in UK bar and rod production in Cardiff, where reductions in electricity prices and in business rates could bring very marked improvements to the UK's international cost positioning.

In specialty steel products, we view security of steel supply to industries that are of strategic importance (such as defence, nuclear power, offshore oil and gas) to be a much more important issue than cost positioning. Here, we consider the key challenge to be merger and placement of key production assets at Sheffield Forgemasters and at Stocksbridge under a new ownership umbrella.

Q2) and **Q3)** What action, if any, should the Government take to support Liberty Steel or the UK steel industry more generally, and what lessons could be learnt from how previous crises in the steel industry were managed? What role could the UK's post-Brexit state aid regime play in supporting foundation industries?

Actions to support the UK steel sector should in MCI's view encompass five matters much discussed in recent press reports[1] (i.e. energy costs, business rates, procurement, temporary trade defence, emissions policy). They should also however extend to a sixth matter – namely state aid for permanent steel plant closure (which is currently disallowed by EU state aid rules). Such support would not only assist UK steel in its transition to lower CO_2 output. If adopted across the whole EU, it would also considerably address industry structure issues in sectors that currently have 8, 9 or 10 competitors battling away for survival; and perhaps also facilitate

[1] Here, we refer to the 'five asks' described in the David Bailey / Paul Forrest conservatorship model. See https://www.business-live.co.uk/opinion-analysis/what-steel-sector-conservatorship-need-11156178

further EU steel industry capacity reduction - an objective that is widely recognised as critical for long-term industry survival.

It is clear that turnaround of the UK steel sector (including decarbonisation) will be a highly capital intensive process. Consideration will need to be given to the potential role of the UK Government in financing this modernisation and to the associated implications on state aid.

Q4) What opportunities and challenges does the Government's net zero target present for the UK's steel industry?

UK became the world's first major economy to set a target of being 'net zero' by 2050, a target that was raised in April 2021 to include a 78% reduction, from 1990 emission levels, by 2035.

A transitional decarbonisation vision is thus presented, of UK Steel fed by 'British Iron', a [potentially] government owned 2-4 mt/year production plant producing direct reduced iron as feedstock for the UK's blast furnaces and basic oxygen convertors in Scunthorpe and in South Wales (and possibly some feedstock for UK's scrap-based steelmaking plants)[2]. In this vision, steel-related CO_2 emissions are significantly reduced. MCI also estimate small but significant improvements in UK flat product cost competitiveness as long as the carbon price exceeds $100-$200 [€83-€166] per tonne, as technology for full conversion to hydrogen steelmaking is developed.

Q5) What role did audit, corporate governance, supply chain finance and other financing methods such as circular invoicing play in the difficulties facing Greensill Capital, GFG Alliance and Liberty Steel? What reforms might be warranted?

This matter does not fall within our main area of expertise. However, reforms involving auditor approvals and a shift to greater transparency would appear to us to be sensible safeguards.

Q6) What financial support have governments provided to GFG? What due diligence was undertaken prior to this support being given, and what checks and balances were put in place in return for this support?

UK production of high volume flat and long products as at Port Talbot, Newport, Cardiff, and Scunthorpe is considered by us to fulfil foundation industry needs. Whilst we recognise that some of these plants (e.g. Port Talbot, Celsa) received UK Government financial support in recent years, we also understand that the UK Government provided certain guarantees to GFG Alliance but rejected Liberty Steel's request for £170m in financial support earlier this year. We have no insights into the checks and balances that may have been put into place for recent financial support, where given.

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[2] A UK Emissions Trading Scheme (UK ETS) replaced the UK's participation in the EU ETS on 1 January 2021. The UK ETS will require steelmakers to pay increasing penalties over time for emission of CO_2, as the net zero target date approaches. Actual CO_2 penalties will depend both on future levels of free allowances for steelmakers, and on the future cost per tonne of CO_2 produced. Use of direct reduced iron (DRI) is potentially attractive, as it is a steelmaking raw material that is associated with less CO_2 output than traditional steelmaking methods.

Looking to the future, we consider that major cuts in industrial electricity prices and in business rates [long products], as well as Government investment in iron production [flat products] could be helpful steps in safeguarding the future cost competitiveness of these steels[3]. We do not consider additional checks and balances to now be necessary for these firms, as long as outstanding obligations (such as Covid loan repayment by Celsa[4]) are fulfilled.

UK production of alloy, stainless and specialty steels (and related powder metals) as at Sheffield, Stocksbridge and Teesside is a different matter however; one that we consider serving the strategic needs of the country. We propose in this report the merger of these specialty metals businesses and the creation of a NewCo (tentatively called British High-Performance Steels) with a new ownership structure. Checks and balances on this business could be undertaken through UK Government ownership of a golden share, allowing the authorities a voice in important financing and investment decisions of the future.

[3] To be clear - in discussions of competitiveness, we refer to relative competitiveness against other steelmakers. Thus, investment in iron production and use of DRI by blast-furnace route steelmakers such as Tata Steel as a supplementary raw material would probably increase steel production costs – but because less CO_2 was produced, the producer's relative costs would decrease.
[4] Reportedly, this loan amounted to £30 million. See https://www.bbc.co.uk/news/uk-wales-53273241

1. INTRODUCTION

1.1 Background

The BEIS Committee is holding an inquiry into Liberty Steel and the Future of the UK steel industry.

On 8 March 2021, the supply chain finance firm Greensill Capital collapsed into administration after months of speculation about its financial viability. Greensill was the principal financial backer of GFG Alliance, owner of Liberty Steel, which is the third largest steel manufacturer in the UK. The collapse of Greensill put 5,000 jobs at risk at Liberty Steel and other firms.

UK taxpayers are reported to be exposed to more than £1bn of debt from the collapse of Greensill via three Government guarantees, including a state-backed coronavirus lending scheme, which enabled Greensill to advance hundreds of millions of pounds to companies linked to GFG Alliance.

On 28 March 2021, the Government rejected a request for £170m in financial support from Mr Gupta for Liberty Steel due to concerns over GFG Alliance's opaque accounting procedures. This raised questions about the effectiveness of auditing and corporate governance regulations, and about the risks posed to UK industry by high-risk financing methods.

The UK steel industry has faced serious challenges for many years, particularly due to the excess of steel on the international market which has depressed prices, and which resulted in plant closures and staff lay-offs during the 2015/16 steel industry crisis. The sector is also grappling with the Government's ambitious target of 2035 to achieve net zero emissions in relation to steel production.

A parliamentary enquiry, launched end-April 2021, invited industry observers to make submissions to the BEIS Committee on the topic of Liberty Steel and the future of the UK steel sector.

This document thus contains submissions on this topic, as prepared by Metals Consulting International Limited (MCI).

1.2 Scope of enquiry

The scope of the present enquiry includes the following six matters.

1. The current challenges facing the UK steel industry and its long-term viability
2. Action, if any, that the Government should take to support Liberty Steel or the UK steel industry more generally, and the lessons to be learnt from how previous crises in the steel industry were managed
3. The role that the UK's post-Brexit state aid regime could play in supporting foundation industries
4. The opportunities and challenges that the Government's net zero target presents for the UK's steel industry
5. The role that audit, corporate governance, supply chain finance and other financing methods such as circular invoicing played in the difficulties facing Greensill Capital, GFG Alliance and Liberty Steel; and reforms that might be warranted
6. The financial support governments provided to GFG; comments on the due diligence that was undertaken prior to this support being given, and on the checks and balances that were put in place in return for this support.

1.3 About MCI

Metals Consulting International is an independent UK-based firm of management consultants who specialise in steel sector restructuring and modernisation. The firm was established in 2003. In previous years, MCI's technical experts have been involved in steel industry turnaround assignments for the UK steel sector, and in the Czech Republic, Ethiopia, Egypt, Kenya, Poland, Russia, Turkey, Ukraine, and elsewhere in Western, Central and Eastern Europe, the Middle East and Africa.

MCI has in the past also worked on several steel industry restructuring projects in the EU for the European Commission; and many of these assignments related to steel industry state aid issues.

For further company information, please visit https://www.metalsconsultinginternational.com.

2. ANSWERS TO QUESTIONS

2.1 Current challenges and long-term viability

Our assessment is that key challenges for UK steel exist with respect to the inter-related matters of market presence and cost competitiveness; as well as, in the case of specialty steels, supply security. With its world class know-how and capability in a number of product markets, the UK steel industry offers attractions to many international investors. Government must remember however that investors have choices; and that the UK steel sector faces strong competition from the industry both from within Europe and from farther afield.

Markets

According to our analysis of the steel industry, using data and methods standardised for all countries, in 2019[5] the UK consumed 9.6 million tonnes of finished steel. This was 0.5% (half of one percent) of world consumption. Demand in 2019 was approximately half the consumption in 1970. In 2019 consumption of finished steel in Germany was 34.7 million tonnes, only slightly less than the combined total of West and East Germany in 1970. Consumption in Japan in 2019 was 64.8m tonnes, higher than in 1970. This shows that it is not inevitable that the steel industry should decline in highly developed countries. The UK is therefore a small and declining consumer of steel products, reflecting the shift in the industrial base of the country.

Of the UK consumption of 9.6 million tonnes 5.8m tonnes was “flat products” (steel sheet and plate, including welded tube made from sheet and plate) and the balance of 3.8m tonnes was “long products” (steel bars, sections, and wire rod), mainly for construction and engineering applications.

In 2019 imports of finished steel products were 6.2m tonnes, accounting for 64% of the market. Imports are a high proportion of the steel market in most European countries because of the extensive trade between countries. In 2019 imports were 63% of consumption in Germany.

UK production of finished steel, as measured by production of hot-rolled steel products, was 6.6m tonnes, of which 3.7m tonnes were flat products and 2.9m tonnes were long products. It is clear from these figures that the UK has a net import (consumption minus production) of flat products of over 2 million tonnes and net import of long products of 0.9m tonnes.

To make those finished steel products the UK consumed 6.8 million tonnes of semi-finished steel (slabs, billets and blooms that are rolled into finished products). Around 0.6m tonnes of those were imported and the UK also exported 0.2m tonnes. Most of the semi-finished steel, and the crude steel to make it, is produced in the UK and, since the closure of the steel plant at Redcar in 2015, exports of semi-finished steel are not large.

[5] Quantitative data for consumption, etc. for 2019 is used because data for 2020, if available, would be distorted by the effect of COVID-19.

One marketing challenge facing the UK industry is therefore to see whether the competitive position in individual products can be improved so that more of domestic demand can be supplied by the domestic industry. The Government may have a role in this respect by encouraging government agencies to ensure that as much opportunity as possible is given to UK producers to supply steel for government projects.

In 2019 UK exports of finished steel products were 3.5m tonnes, 54% of production. In Germany exports were 22.6m tonnes, 64% of their much larger production of hot-rolled steel products of 35.6m tonnes. The share of UK production that is exported is high, but the UK's share of the world steel market is only one-tenth of the share taken by Germany. Japan has a similar level of exports to Germany. Germany has this strong position in the export market despite having relatively high costs to produce steel, so cost advantage does not fully explain market advantage, particularly in the higher quality steel products[6].

A second marketing challenge for the UK industry is therefore to increase its share of the available export market and so increase production and employment in the UK.

Product Mix

The UK produces most significant flat and long steel products and has in its plants a well-balanced product range. Steel sheet and coated products (galvanised steel and tinplate) are produced by Tata Steel at Port Talbot in Wales and at other sites and by Liberty Steel (GFG Alliance) at Newport. Steel plate is produced by Liberty Steel in Scotland and by British Steel (Hebei Jingye) at Scunthorpe. Merchant bar is made by Liberty Steel in Scunthorpe. Steel bar and wire for the construction industry is produced by Celsa in Cardiff. High quality steel bar for the automotive and engineering industry is produced by Liberty Steel in Rotherham and Sheffield. Sections (steel beams) and railway rails are produced by British Steel at Scunthorpe and Teesside. Forgings and special steels are produced at Sheffield Forgemasters in Sheffield. Stainless steel is produced by Outokumpu in Sheffield. Tata and Liberty Steel produce welded tubes using the hot rolled coil and plate from their UK plants. Part of the industry's capacity is also highly capable in the production of steel required for strategic national purposes (aerospace and defence products).

The only major product in which the UK industry does not have significant capacity is seamless tubes, which are used mainly in oil and gas exploration and development. Those are markets that will, however, be in long-term decline.

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[6] We attribute this strong export performance to (i) the perceived quality of German steel products and associated reputation and track record with buyers (ii) Germany's emphasis on product development to meet the changing requirements of customers, including working with the customer to develop the products they need (iii) the large overseas manufacturing base of German and Japanese enterprises (car makers, etc.), buying steel from the home country through a centralised purchasing for their global network. The more they have shifted manufacturing plants (car plants, machinery plants, steel processors and service centres) out of the home country to Eastern Europe or SE Asia, the more they export (iv) In the case of the Japanese, a strong preference among domestic consumers to buy local steel, as well as non-tariff barriers that effectively keep imports at very low levels despite zero tariffs.

The question for the future is therefore not whether more capacity is needed to fill a gap in the pattern of supply, but whether the existing capacity is competitive in the domestic and export markets in product quality and cost.

Prospects of Existing Producers

Unless the Government takes over the industry, its future development will depend on investment by the private companies identified above. That will be determined by their motivation and financial position. Motivation will depend on the expectation of profitable operation in the UK relative to the alternatives available to the companies and the priorities of management.

Company Strategies

As noted earlier, the UK is a small part of the world steel market. It is also the case that the UK's steel plants are part of the larger systems of their parent companies.

According to our information, Tata Steel has worldwide crude steel capacity of 29 million tonnes, of which the UK is 5.6 million tonnes. Tata has been trying to sell its European steel operations in order to concentrate its efforts in its home country, India. Its other main operation in Europe is a larger plant to Port Talbot in the Netherlands. We estimate that that plant has slightly lower costs of production than Port Talbot[7]. There must be doubt about Tata's commitment to its steel operations in Europe and if there were to be cutbacks Port Talbot is more likely to be closed than the plant in the Netherlands.

Hebei Jingye is a Chinese steel company and industrial group with capacity of at least 10 million tonnes in China. Their 2020 purchase of British Steel is a major venture for the group and is part of trend for Chinese steel companies to invest outside China and internationalise. This probably means that the company will make major efforts to create a success from the venture, otherwise it will lose credibility with its competitors and with the central government in China.

Celsa is a producer of steel products headquartered in Spain, with 10m tonnes total capacity, of which the UK is 1.4m tonnes. Because of its large capacity in Spain, the company has struggled financially in the face of a massive decline in construction activity there after an earlier boom. Re-structuring their various plants in Spain is the main priority of the group at present. The UK plant and associated downstream firms serving the construction industry is probably one of the more profitable Celsa businesses.

Liberty Steel (GFG Alliance) has capacity of 22m tonnes, of which the UK is 1.2m tonnes. The group has expanded massively in recent years with acquisition of large steel businesses in Australia, Czech Republic, Romania and the USA. These were mainly acquired from owners in financial difficulties or as a result of sales forced on the large steelmaker ArcelorMittal by the European Commission as a condition of other mergers. These acquisitions, coupled with an

[7] The lower cost in the Netherlands is, we believe, driven by larger scale and access to a particular good deep-water port. Lower electricity costs in the Netherlands are likely to play only a small part in the lower costs, in our view.

unconventional approach to financing, overstretched the capability of the Group and led to serious cash-flow problems in 2020 and 2021 and many questions concerning GFG Group's long-term viability.

The group is based in the UK and its UK operations are recognised as important. It was ahead of most other steel companies, at least in its publicity, in promoting the concept of "Green Steel", using the electric steel process to reduce emissions of carbon dioxide. Among its plans was the re-installation of electric steelmaking at its plant in Newport to make the slabs used at its hot rolled coil mill.

The assets acquired are producers of a wide range of flat and steel products, but the Group also has a focus on engineering steels with its plants at Rotherham and Sheffield and large operations acquired in the USA.

The group's priority in the short term will be the consolidation of its financial position and management of a disparate group of assets around the world. The UK will probably not be a prime focus for some time.

Outokumpu is a major producer of stainless steel with capacity of 4 million tonnes, of which 0.8m tonnes is in the UK. The company has as strong position in the stainless steel market and the UK plant is an important part of the operation. . The melting shop in Sheffield (called SMACC) produces continuously-cast slab and bloom and a limited volume of ingots. There is also a billet caster that supplies amongst others, the nearby ASR rod mill. Outokumpu's main plants are in Finland, Sweden, UK, and USA. The stainless steel industry in Europe has been under pressure in its export markets and selling prices from excess capacity in China and it will be important for the UK plant to maintain its competitive position in the group.

Competitive Position

The competitive position of the producing companies needs to be considered in two respects: the current position and the future position in the light of climate change and decarbonisation of the economy. The future position is be considered below under question 4 '*Opportunities and challenges associated with net zero target'*.

According to our estimates of production costs for flat steel in 2021 Q1 (using the benchmark product hot rolled coil), Tata Steel at Port Talbot is among world plants in the highest cost quartile (see Appendix 1, Chart A). This sounds bad, but the plant's costs are estimated to be lower than some other large European plants, in Belgium, Germany and Italy. Like those other high-cost producers, Tata operates the "integrated" steelmaking process with coke ovens, blast furnaces and basic oxygen steelmaking. The main cost for such plants is the cost of imported iron ore and, to a lesser extent, coking coal. Prices of iron ore are currently exceptionally high (and seem set to remain at high levels relative to the past for the foreseeable future) and there is a massive cost advantage for steel companies with their own iron ore mines, as in Russia, Ukraine, India (including Tata Steel's operations there) and Brazil.

We estimate that Liberty Steel's cost position in the production of hot rolled coil in the UK is even less favourable that Tata's. This is because the plant purchases slabs for rolling in

Newport instead of producing them from its own steel at the plant. At present the price of slabs is exceptionally high relative to the price of hot rolled coil. This type of producer (a "re-roller") is vulnerable to variations in the market for slabs and the business generally has low margins. Because of overseas acquisitions Liberty Steel now has plants in Australia, Czech Republic and Romania that can supply slabs to the UK plant to replace 3rd party purchases. The improved viability of the plant in Newport could therefore depend on the continued operation of those plants as part of the GFG Alliance Group.

We estimate that the plant of British Steel at Scunthorpe has a better relative cost position than the UK producers of flat products, with about 67% of the world's capacity having lower costs. This is because the production of these products is heavily concentrated in plants using the integrated process located in high-cost areas such as Luxembourg and Germany. As for Tata, the main cost factor for British Steel is the cost of imported iron ore and coking coal.

The cost position of Celsa in the production of steel bar is estimated to be relatively more favourable than Tata or British Steel, with cost much closer to world average (Appendix 1, Chart B). The Celsa plant uses a relatively modern electric furnace to melt steel scrap, so has a completely different cost structure from the integrated plants. The main cost factors for the plant are purchased steel scrap and purchased electricity.

The cost structure of steel production varies widely between plants depending on their location and arrangements for raw materials. The sensitivity of a plant's competitive position to absolute changes in its cost of production is an important factor to consider when determining policy. We estimate, for example, that the cost of electricity for Celsa is ~$61 per tonne of bar, and that business rates amount to perhaps $7/tonne - out of a total cost of US $671[8]. If the price of electricity and of business rates were reduced by 50%, that would cut cost by roughly $34 per tonne. Such a subsidy would move the plant down the industry cost curve quite significantly, bringing a notable improvement in the plant's competitive position (Appendix 1, Chart B).

In the case of Tata or British Steel those plants generate part of their electricity from by-product gases from their coke plants and blast furnaces. A reduction in the price of electricity does not affect that part of their production costs, so a reduction in the price of purchased electricity by 50% might reduce their costs by only $15 per tonne. Similarly, a 50% cut in business rates might reduce their costs by another $5/tonne. Such a reduction, whilst worth many millions of pounds per year to the business, might move the plant of Tata Steel at Port Talbot from a production cost of $788 to $768, from a position where 88% of the capacity has lower costs to one where ~85% has lower costs. Despite the large subsidies of electricity costs and business rates involved, this change brings about an essentially insignificant change in the competitive position of the plant (Appendix 1, Chart A).

At Scunthorpe and Teesside, we similarly conclude that significant reductions in electricity costs and business rates, whilst again worth millions of pounds per year to British Steel, would not have a major impact on heavy section costs or competitive positioning (Appendix 1, Chart C).

[8] In the steel industry the US dollar is used as the currency for international market prices and references to prices and cost in this paper are in US dollars.

Changes to individual cost factors over which the Government may have some influence (electricity and other energy prices, business rates and taxes, labour costs through assistance with training, etc.) therefore need to be evaluated in relation to the varying cost structures of different types of producer.

Financial Position

In May 2021 steel prices are at or above their previous all-time high. This is the result of a combination of a strong recovery in the major economies after the slowdown in 2020; heavy, or even panic, buying by consumers in anticipation of that economic recovery; restrictions to supply caused by COVID-19; and continued very high activity in China causing tightness in the markets for steelmaking raw materials. Costs of production have risen, but prices have risen far more. The profits of major steel companies for 2021 will be measured in the billions of dollars. In this short-term situation we expect that steel producers such as Celsa and Liberty Steel will find commercial sources of finance for their immediate operations. The role of Government in this respect may therefore be limited to providing comfort for lenders or investors in the form of policies or statements that demonstrate commitment to the future of a substantial steel industry in the UK, i.e. being seen to be ready to address any real issues that affect the competitive position of the industry.

As will be discussed in a later section, in the longer term, decarbonisation of the steel industry will require huge investment. The issue of financing for that will be considered in that later section.

Viability

If long-term viability of the UK steel sector is a central objective, MCI's view is that the sector might best be considered in terms of at least three segments, spanning both foundation industries (high volume flat rolled steels and heavy and light long products) and strategic needs (specialty steel products). That is:

- In terms of the high-volume carbon flat rolled steels produced by Tata Steel in South Wales, and long products produced by British Steel in Scunthorpe, solutions to long term competitiveness would appear to necessitate relatively large-scale production cost reductions of perhaps $100/tonne or more (Appendix 1, Charts A & C). Investment in the UK in production of DRI (together with cuts in electricity prices and business rates) could offer one such solution, especially if a high carbon cost prevailed. A vision of the UK steel sector in this scenario is included in Appendix 2. We consider this option further in Section 2.4.

- In terms of high-volume long products, such as the bar or rod made by Celsa, our view is that substantial improvements to cost competitiveness could indeed be brought about through marked reductions in electricity prices and business rates.

- In terms of low-volume specialty products such as the alloy, stainless and other specialty products produced by Sheffield Forgemasters / Stocksbridge / Liberty Powder Metals. Here, our view is that security of steel supply is much more critical than cost competitiveness[9]; that removal of these businesses from Liberty ownership may be desirable; and that merger of the various businesses into a newly formed business is indicated. This topic is considered in greater detail below - see Section 2.6 and vision of 'British High-Performance Steels' described in Appendix 3.

2.2 Action to support Liberty Steel or UK steel industry generally; lessons learnt

A 'conservatorship model' described by David Bailey and Paul Forrest in 2016[10,11] reviewed the requirements of the UK steel sector and proposed 'five asks' for the industry. These included:

- energy costs
- business rates
- procurement
- temporary trade defence
- emissions policy.

MCI wholeheartedly agree with the need for this five-pronged approach. We touch on the first two matters especially elsewhere in this report; and we specifically address emissions policy in Section 2.4 below.

We would however add a 'sixth ask' below, which concerns a broadening of state aid to include support for permanent iron and steel plant closure. This matter is considered further in Section 2.3 below.

[9] If we wish to build nuclear submarines in the UK, we need Sheffield Forgemasters.
[10] See https://www.business-live.co.uk/opinion-analysis/could-government-conserve-uks-steel-11145306?_ga=2.205543446.401877578.1620642944-1641132391.1620121738
[11] See https://www.business-live.co.uk/opinion-analysis/what-steel-sector-conservatorship-need-11156178

2.3 Future UK state aid

Current state aid rules

The previous section identified the potential impact of specific measures that could assist the industry, such as reduction in the price of electricity or the lowering of business rates[12].

Although the UK is no longer a member of the EU, a large part of the steel exports from the UK goes to EU countries, including transfers between UK and EU operations within the same company. The extent and nature of any future state aid must therefore be determined in the context of the permissible actions under EU regulations, otherwise trade disputes and punitive measures against UK exports will arise. Exports are also made in some cases to the USA and direct state aid is always subject to scrutiny by the US authorities. The UK is currently one of the countries subject to the "temporary" US tariff of 25% on steel products, imposed in 2018.

On the same issue of international trade, the UK itself will need to have a policy of monitoring imports of steel products, perhaps similar to the "safeguarding measures" of the EU, to prevent dumping of steel products in the UK market. If the EU continues to have such a policy, even if it is not justified in the current situation of high profitability for the steel industry, the UK will need to have a similar policy, otherwise it will be easy for exporters to the EU to divert their products to the UK market. That could be damaging to all the main producers and delay them in strengthening their financial position in the near term.

Apart from the control of unfair trade, mentioned above, and measures in connection with decarbonisation, which will be discussed later, the actions of the Government that can assist the steel industry, without state aid problems with the EU or USA, will probably be assistance with research and development, adoption of new energy-saving technology and manpower training and retraining.

As discussed earlier, the major UK steel producers are all part of larger companies. The position of the UK plants must fit within the wider systems of production and supply of those companies. Hence, any aid for the UK industry must consider its impact, as seen by the companies, on their total operations. This may mean that aid to the whole company may be needed to ensure that the UK part of that company continues to function effectively. As an example, a hypothetical case might be one in which aid to Liberty Steel permits it to improve its plant in Romania so that lower-cost slabs can allow its plant in Newport to remain in operation. Strictly limiting assistance to operations in the UK may not be effective in assisting companies with what they really need to maintain their UK operations.

[12] To be clear, MCI views these energy and business cost subsidies as 'horizontal' rather than 'sectoral' state aid, as we envisage them as potentially applying to a number of energy intensive industries – including also minerals, bulk chemicals, paper, etc; as but one component of UK industrial strategy.

<u>Future state aid rules</u>

Whilst MCI recognise the importance of UK steel operating within existing state aid rules, and we note that the EU allows steel sector aid for research, development, and innovation; for environmental purposes; and for retraining - we observe also that state aid is <u>not</u> allowed by the European Commission for permanent steel plant closure[13].

We note at the same time however that:

- There exist numerous examples in Europe of steel sectors where there exist 8, 9, 10 or more competing plants. These examples include steel bar products in Poland, reinforcing bar in Spain, cold rolled stainless steel production in Germany etc[14], where in our view it is the industry structure that makes it impossible for viability [and further investment] to be attained.
- The World Steel Association considers that the steel industry in the EU must reduce capacity by up to 50% if it is to survive[15]. Should state aid be allowed for permanent closure, EU agreement to state aid for permanent steel plant closure might speed up the process of capacity rationalisation.
- State aid for permanent closure of coke plants, sinter plants, blast furnaces and oxygen furnaces is in any event likely to prove a useful tool to facilitate decarbonisation in the UK.

On this basis, MCI consider that a revision of state aid rules, permitting aid for permanent steel plant closure[16], would be an appropriate ‘sixth ask’ to add to the ‘five asks’ list of Bailey and Forrest. Broadening of state aid rules might thus be a topic for further discussion within the BEIS and / or with the European Union in due course.

2.4 Opportunities and challenges associated with net zero target

For the market what matters is the production and consumption of finished and semi-finished steel products. For the environment what matters is the production of crude steel and the iron needed to make it. In 2019 the UK produced 7.2 million tonnes of crude steel, of which 5.7m tonnes was by the blast furnace iron/basic oxygen furnace steel (BF/BOF) process and the balance of 1.5m tonnes was by the electric arc furnace (EAF) process using steel scrap. The UK produced 5.6m tonnes of blast furnace iron.

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[13] See ‘EU state aid rules for the steel sector’ at https://www.oecd.org/sti/ind/Item%25203c_3-%2520EU_OECD-Steel.pdf. Note also that according to this document (see slide 7), EU state aid for uncompetitive coal mine closure is allowed.
[14] Source: James King steel capacity database.
[15] See https://www.telegraph.co.uk/finance/newsbysector/industry/11997877/European-steel-industry-must-halve-by-2030-in-order-to-survive.html
[16] This aid might include financial support to cover losses for a restricted period, costs of contract termination, as well as payments for planning, communications, dismantling of equipment, site clean-up, site remediation etc.

UK Emissions of CO_2 from the Steel Industry

According to our analysis, in 2019 the UK steel industry emitted 11.9 million tonnes of carbon dioxide, including emissions from the generation of electricity used in the industry, equivalent to 1.66 tonnes of CO_2 per tonne of crude steel. Germany emitted 69.8m tonnes at 1.64 tonnes of CO_2 per tonne of crude steel. China emitted 2322.6m tonnes (200 times the UK) at 2.33 tonnes of CO_2 per tonne of crude steel. The UK steel industry is thus a minor contributor to global CO_2 from steel production

Our forecast of the steel market, allowing for a continuation of past trends in the change in steelmaking processes and efficiencies, shows that the emission of CO_2 in the UK would develop as follows (Exhibit A) and that by 2050 the emissions per tonne of crude steel would be 0.92 tonnes. This a large reduction, but it is far from zero carbon.

Exhibit A: MCI production forecasts for steel sector CO_2 production in the UK

Year	CO_2 production volume (mt)
2019	11.9
2030	9.4
2040	7.2
2050	5.6

Source: MCI in-house projections.

Switch to Electric Steel

Major steel companies are very actively investigating alternative technologies to reduce carbon dioxide. One of these is the switch from BF/BOF steel production to electric steel using scrap. This is the concept of Liberty Steel's "Green Steel". In 2019 the UK exported 7.2 million tonnes of scrap, imported 0.5m tonnes and consumed 2.5m tonnes. In principle, therefore, the domestic supply of scrap, assuming it continues at the current level, could permit the UK to produce all the steel produced in 2019 by the electric furnace process.

In this situation Tata Steel at Port Talbot and British Steel at Scunthorpe would close their BF/BOF steelmaking and replace it with EAF steel. If those electric furnaces could use electricity generated by wind or solar power, the electricity would have no carbon emissions and the only emissions from the steel industry would be small emissions from the carbon graphite electrodes used in the electric furnaces and any gas still used to reheat the steel during the rolling process. This would reduce UK emissions of CO_2 from the steel industry in 2050 to 0.9m tonnes (0.13 tonnes per tonne of crude steel). It would be possible to reduce that even further if the reheating of steel in the downstream processing could be done by renewable electricity instead of gas. This would be as close to zero carbon as it is possible to get, while retaining a large steel industry.

If the two BF/BOF producers followed this strategy they would close their coke plants, blast furnaces and oxygen steel furnaces and install large EAFs. Downstream operations of steel refining, casting, and rolling would be unchanged. We estimate that a new EAF steel plant costs $190 per annual tonne. To replace the UK's 11 million tonnes of BOF capacity would therefore cost $2.1 billion. There would probably also be substantial additional costs to rehabilitate the sites of the coke and blast furnace plants. Government assistance would be immensely helpful to the companies to undertake that scale of expenditure, perhaps in the form of loans or loan guarantees under a decarbonisation programme and assistance with clean-up costs under an environmental rehabilitation programme. Employment would undoubtedly be reduced because the manning of the EAFs would be less than half that of the integrated plant. Financial assistance with redundancy and retraining would be essential.

A guaranteed supply of electricity would also be required. EAF furnaces will use about 500 kWh per tonne of crude steel, so 11m tonnes of additional EAF capacity in full operation would need 5.5 million MWh or about 740 MW of power station capacity. That is not much more than the size of one unit (660 MW) at a large power station and is well within the capability of modern windfarms.

The scrap supply position of the UK, if supplemented with improvements in scrap processing capability, means that it should be possible to make this transformation. Whether it would reduce the cost of production for Tata and Jingye would depend on the price of steel scrap and purchased electricity in relation to the prices of iron ore and coal at the time.

If all steel producers in the world attempted to close their BF/BOF plants to replace them with EAF steelmaking, there would not be enough scrap in the world to permit this. It is also the case that certain steel products cannot easily be produced by the EAF process and some production by BF/BOF would be needed. As time passes, improvements to EAF steelmaking and downstream processing have demonstrated that this range of unsuitable products is shrinking, perhaps to nothing in the longer term.

One way of avoiding the shortage of scrap is to increase the use of scrap substitute materials. One substitute is pig iron, which is not a solution since it is mainly produced in blast furnaces. Another substitute is direct-reduced iron (DRI). Like blast furnace iron, this is produced from iron ore.

Iron ore consists of iron, oxygen, and small quantities of impurities. In the blast furnace process oxygen is removed by combining with carbon in the form of coke. The coke heats the furnace and melts the iron. Impurities in the iron ore float off and are removed as slag. The product is pig iron. The combination of oxygen with the carbon in the coke produces large quantities of carbon dioxide. The production of coke from coal in a coke plant produces more carbon dioxide.

In the DRI process the oxygen is removed by combining it with hydrogen without melting the iron. The hydrogen is obtained by “reforming” natural gas, separating the hydrogen from the carbon. This generates some carbon dioxide. Since the iron is not melted, it is not possible to float off the impurities as a slag, so they remain in the DRI and pass into the steel. For this reason it is necessary to use iron ore with very low impurities in the DRI process.

The steel industry is working on processes that use hydrogen produced directly from water, using electricity to separate the hydrogen from the water. If the electricity is from renewable sources, this creates no carbon dioxide.

DRI can be used in electric steel furnaces instead of steel scrap up to almost 100% of the feed. This is normally done in locations where there is little steel scrap or where the costs of production of DRI are so low that it is cheaper than scrap.

DRI can also be used in blast furnaces to replace some of the iron ore and in basic oxygen steel furnaces to replace some of the pig iron. The steel company Voest-Alpine already uses DRI from its new plant in the USA in its blast furnaces and BOF furnaces in Austria. At present the DRI is produced in the USA from natural gas.

The development of the hydrogen-based DRI process would permit existing BF/BOF operations to continue operating with reduced CO_2 emissions. The capital expenditure, disruption to operations and loss of employment from this process are smaller than would occur in a complete switch to electric steelmaking.

In the short term it could permit the BF/BOF steel plant to add purchased DRI from existing sources that now use natural gas. In the longer term the steelmaker could add DRI capacity to supply the BF/BOF process, initially using natural gas and later converting to hydrogen

If this process were applied to the plants of Tata at Port Talbot and British Steel at Scunthorpe, with use of DRI at 32.5% of the feed (25% in the blast furnace and 7.5% in the steel furnace), with 11m tonnes of crude steel capacity, this would require 3.58 million tonnes of DRI capacity[17]. This assumes that the existing EAF steel producers would not require DRI, as they already have low-carbon production using steel scrap.

If the DRI plant were at one location and not split between the two sites, we estimate that the capital cost for a conventional DRI plant of this scale would be $350 per annual tonne, a total of ~$1250m. Further capital investment would be needed in the longer term to build a hydrogen production plant. Our information suggests that one tonne of DRI using hydrogen requires 205 cubic metres of hydrogen, so a plant of 3.57m tonnes would need 734m cubic metres. The cost of large-scale hydrogen plants is not known, but it certain to fall as large plants are built . The current cost of a small-scale hydrogen plant is about $5,000 for capacity of one cubic metre per hour (8760 cubic metres per year). If that could fall to $3,000 with economies of scale, a plant of 734m cubic metres would cost $250 million. The combined capital investment in DRI and hydrogen would then be ~$1500 million.

Production of hydrogen currently uses about 4 kWh of electricity per cubic metre, so a plant of 734m cubic metres would need 2.9 million MWh or about 400 MW of power station capacity.

The economics of the process would depend on the price of electricity.

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[17] These figures describe a 'maximum' blast furnace DRI scenario. Appendix 2 shows a 'transitional' blast furnace scenario involving lower iron and steel production volumes and involving investment in under 2 mt of DRI capacity.

For the steelmakers this is a more uncertain technical process than conversion to electric steelmaking. Development of a successful process for large-scale hydrogen production using renewable energy is, however, probably a national priority for more general reasons than those affecting only the steel industry. Substantial government financial assistance for this type of development could therefore be justified based on national energy and environmental policy, with the steel industry being used as the test for real-world application of the technology[18].

If many steel companies follow the DRI route this will greatly increase the demand for the high-grade iron ore used in the process. That is currently produced by very few iron ore companies (in Brazil, Sweden, Canada, and Russia). Lower-grade iron ores now used in blast furnaces would have to be upgraded by further processing, where technically possible. Supply of iron ore would become a problem for the whole steel industry unless very large investment is made by iron ore producers to upgrade their products. This may be a strategic reason for steel companies to invest in iron ore operations to ensure supply for their new processes.

Transitional Scenario

Appendix 2 illustrates a transitional scenario in which the UK invests in a single 2 mt/year capacity DRI production plant, with DRI production serving in the main to:

- reduce CO_2 emissions in blast furnace operations
- reduce CO_2 output in the BOF
- simultaneously reduce coke and sinter production (and associated CO_2 output)
- maintain a large, competitive integrated steel sector with higher employment than a complete switch to electric steelmaking
- eventually provide a large-scale consumer for the development of hydrogen extraction technology that would benefit the whole economy.

This scenario can further be described in terms of the expected HRC production costs for a typical integrated steel plant such as Port Talbot. Such assessments are shown in Exhibit B, which indicates estimated production costs at three stages of transition (i.e. BF/BOF today, BF/BOF in transition with DRI, and EAF)[19].

[18] Consideration should be given to the state aid implications of such support, because of the potential distortion of competition.
[19] For these purposes, we assume all DRI to be Midrex-produced, using natural gas (not hydrogen); and that the EAF uses 100% scrap only.

Exhibit B: Port Talbot HRC production cost estimates at different stages of transition

Transitional stage	**CO_2 t/t**	**Carbon price $ / tonne**		
		€38 / $46	€83 / $100	€166 / $200
		Total cost HRC $/t		
BF/BOF	2.13	788	918	1131
BF/BOF + DRI	1.67	801	906	1073
EAF	0.08	686	692	700

Source: MCI in-house cost determinations. Carbon price of $46/t represents current CO_2 cost of ~Euro 38/tonne. Hydrogen-based steelmaking costs are too uncertain to be included above.

Whilst not surprisingly, the comparisons in Exhibit B indicate that the cost relativities are much dependent on the future cost of carbon, they also indicate that:

- The switch from BF/BOF to BF/BOF plus DRI can significantly help with the cost competitiveness of the BF/BOF process route for production of HRC, with the cost improvement attaining ~$60/t at a carbon cost of $200/t CO_2 [€166/t]. Such a $60/t improvement, if added to the $20 cost reduction arising from the electricity cost and business rates subsidy mentioned above, would in our assessment immediately transform Tata Steel from a high-cost world producer of HRC, to an average cost producer. It would at the same time also reduce CO_2 output by almost 0.5 tonnes / tonne, or over 20%.

- With the switch to EAF steelmaking, the improvement in cost competitiveness is greater still, even with CO_2 costs at today's level of $46/t [€38/t]. At the time of writing, iron ore costs are at an all-time high, so any relativity between BOF and EAF steel costs should be interpreted with caution.

The conclusion of Exhibit B must nonetheless be that investment in 'British Iron' should be worthwhile from the environmental, economic and employment perspective; but perhaps unavoidable if competing European plants continue to move rapidly towards the use of hydrogen-based DRI for use in their existing BF/BOF plants.

2.5 Audit, governance, finance, and related issues; potential reforms

We have no expertise in accountancy or audit, but it is possible that companies such as Liberty Steel and Jingye may need assistance to align their accounting practices across their operations with those acceptable to the UK authorities. This may be a complex process and forbearance may be necessary while this is worked out. Approval of Government-approved auditors for the steel sector may be involved in this step.

It is also the case that international transfers of products within company groups will need clear and acceptable procedures for the transfer pricing of goods for corporation tax purposes.

This type of administrative issue is not insignificant – it creates the climate for doing business and it affects decisions about future investment. That is the case whether the administration is at the national, regional, or local level – all stakeholders need to be aware that these companies all have choices about where to operate their steel plants.

2.6 GFG financial support; due diligence procedures; checks and balances

MCI have no insight into the checks and balances that may have been put into place, as relating to historic government support for the UK steel sector. We also see no especial need for new checks and balances to be imposed on the UK's high volume steelmakers (Port Talbot, British Steel, Celsa Steel) as long as historic government loans (such as the £30m emergency Covid loan extended in 2020 to Celsa, for example) are repaid.

Below however, we comment on future financial checks that might be applied to the UK special steel sector, within a new ownership structure. A vision of the UK specialty steel sector ('British High-Performance Steels') in such a new ownership structure is described in Appendix 3, and assumes a grouping of the following assets:

- Sheffield Forgemasters
- The plant and equipment owned by Liberty Special Steels at Stocksbridge
- The production plant at Liberty Powder Metals in Teesside.

The rationale for this merger is several-fold but includes:

- The financial difficulties of Liberty Steel, which in a worst-case scenario could lead to business closure; and if not resolved soon may not only constrain future growth but possibly also disrupt ongoing production.
- The existence of surplus electric capacity at Forgemasters, and the absence of electric steelmaking capacity at Stocksbridge (indicating production synergies)
- The common customer base of these businesses (suggesting marketing synergies).

A different ownership structure for the newly merged specialty steel business could of course include Liberty Steels, with a minority ownership stake. A preferred ownership structure might also involve UK ownership of some form (such as through a customer consortium including BAE Systems, Rolls Royce, or suchlike). Regarding checks and balances, and in order to safeguard the business in the future, MCI would however recommend UK Government ownership of a golden share in the new business, allowing the authorities a voice in important financing and investment decisions of the future.

3. SOURCES OF INFORMATION

3.1 Information sources

This report was prepared using public information, together with use of MCI's in-house steel cost model . Information sources included:

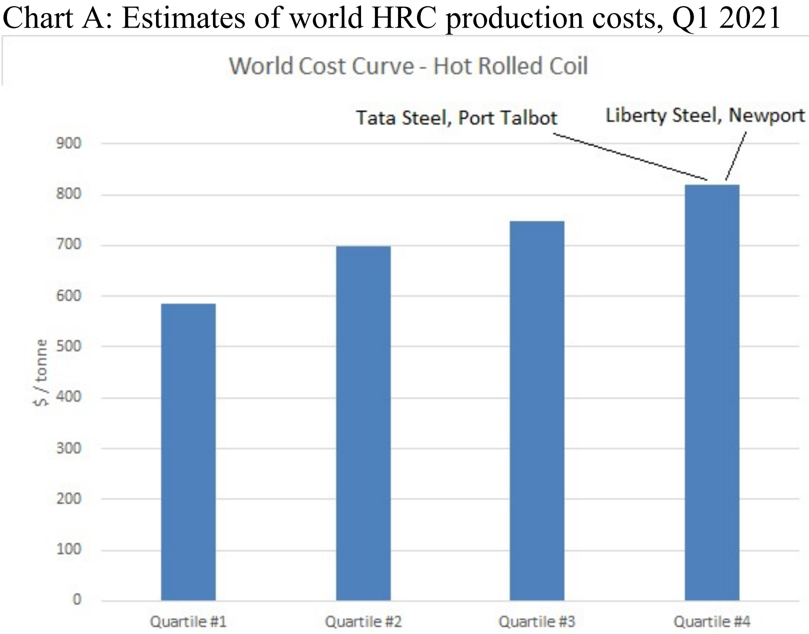
- 'UK steel industry: statistics and policy'; House of Commons Briefing Paper Number 07317, January 2018
- 'Decarbonisation of the Steel Industry in the UK', Syndex / Materials Processing Institute, March 2021
- 'Capital Investment Cost for Plant and Equipment in Iron and Steelmaking', MCI report, December 2010. See https://www.steelonthenet.com/commerce/profiles/capex-report.html
- 'Industrial Decarbonisation & Energy Efficiency Roadmaps to 2050: Iron and Steel', WSP / Parsons Brinckerhoff / DNV-GL, March 2015
- 'Future Capacities and Capabilities of the UK Steel industry, BEIS Research Paper Number 26, December 2017
- 'European steel industry 'must halve by 2030 in order to survive', Daily Telegraph, 16th November 2016. See https://www.telegraph.co.uk/finance/newsbysector/industry/11997877/European-steel-industry-must-halve-by-2030-in-order-to-survive.html

Other main sources are as attributed in the text.

APPENDIX 1: International cost competitiveness of selected UK steel plants

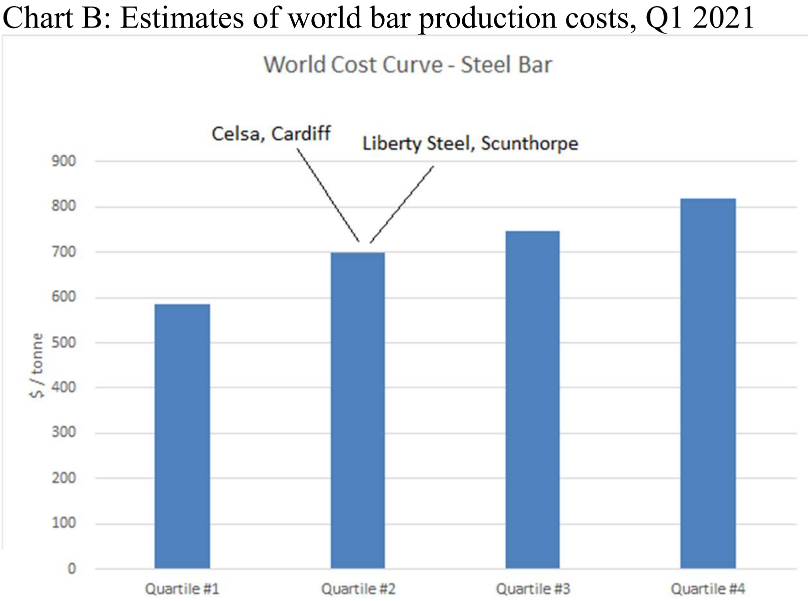
Below, we indicate our assessments of the international cost-competitiveness of selected UK steel plants[20].

Chart A: Estimates of world HRC production costs, Q1 2021



Even with a 50% electricity and rates cost subsidy lowering integrated HRC costs by ~$20/t, a firm such as Tata Steel would remain a high-cost producer of HRC

Chart B: Estimates of world bar production costs, Q1 2021

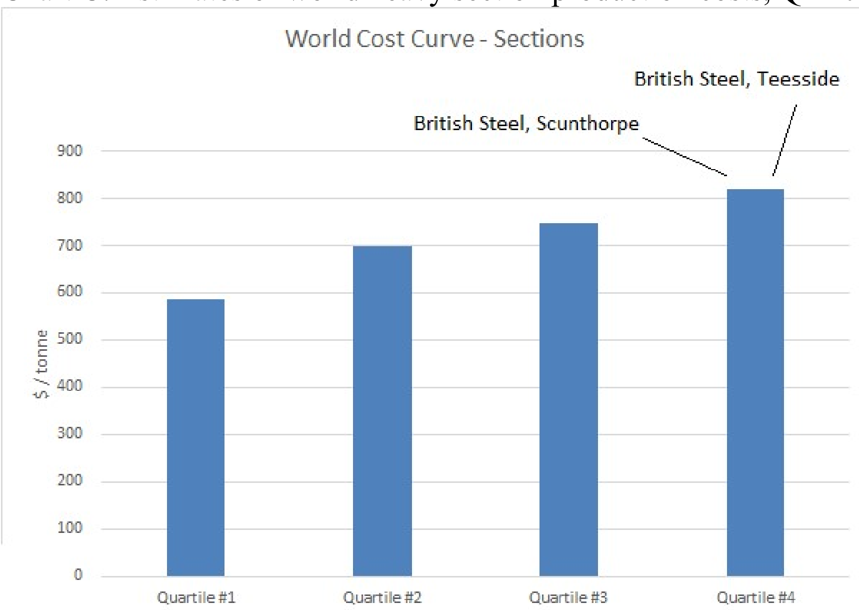


With a 50% electricity and rates cost subsidy lowering EAF-based bar costs by ~$34/t, a firm such as Celsa would prove highly competitive in the international context

[20] Production costs are shown, based on Q1 2021 cost inputs, including carbon costs at $46/tonne [€ 38/t]. Costs represent total costs, i.e. including depreciation and capital charges, as positioned in the 1st, 2nd, 3rd, or 4th global production cost quartile. For sections in Chart C, production costs as shown for heavy sections over 80mm.

APPENDIX 1: International cost competitiveness of selected UK steel plants (cont'd)

Chart C: Estimates of world heavy section production costs, Q1 2021



Even with a 50% electricity and rates cost subsidy lowering BF/BOF route long product costs by ~$20/t, a firm such as British Steel would remain a high-cost sections producer

APPENDIX 2: Vision of UK steel sector during transition, incl 'British Iron'

We show overleaf a schematic portrayal of the UK steel sector during transition, based on estimated 2019 production volumes. By transition, we refer to a period during which the UK might commence production of direct reduced iron, as partial feedstock for its blast furnaces, and BOF / EAF steelmaking units.

We tentatively refer to the proposed DRI production plant as 'British Iron'[21]. Initially, we propose that this plant might have a production capacity of ~2 mt / year of direct reduced iron[22].

In MCI's assessment, the minimum efficient scale for such a facility is ~1 mt / year of DRI output. As an indication, the capital cost of a 2 mt/year DRI plant is assessed at ~$700 million[23] for Midrex-based technology. HIsarna, an iron-making process currently under development by Tata Steel at Ijmuiden in the Netherlands, may however be an alternative technological option.

Over time, this DRI facility might develop as follows:

- Grow to ~4 mt / year or even ~6 mt / year of direct reduced iron capacity, with DRI steelmaking ultimately replacing all UK production via the BOF steelmaking route.

- Evolve as technology development allows to use progressively more hydrogen and ultimately, hydrogen alone.

Preferred locations for the British Iron DRI plant(s) could include South Wales and / or Scunthorpe.

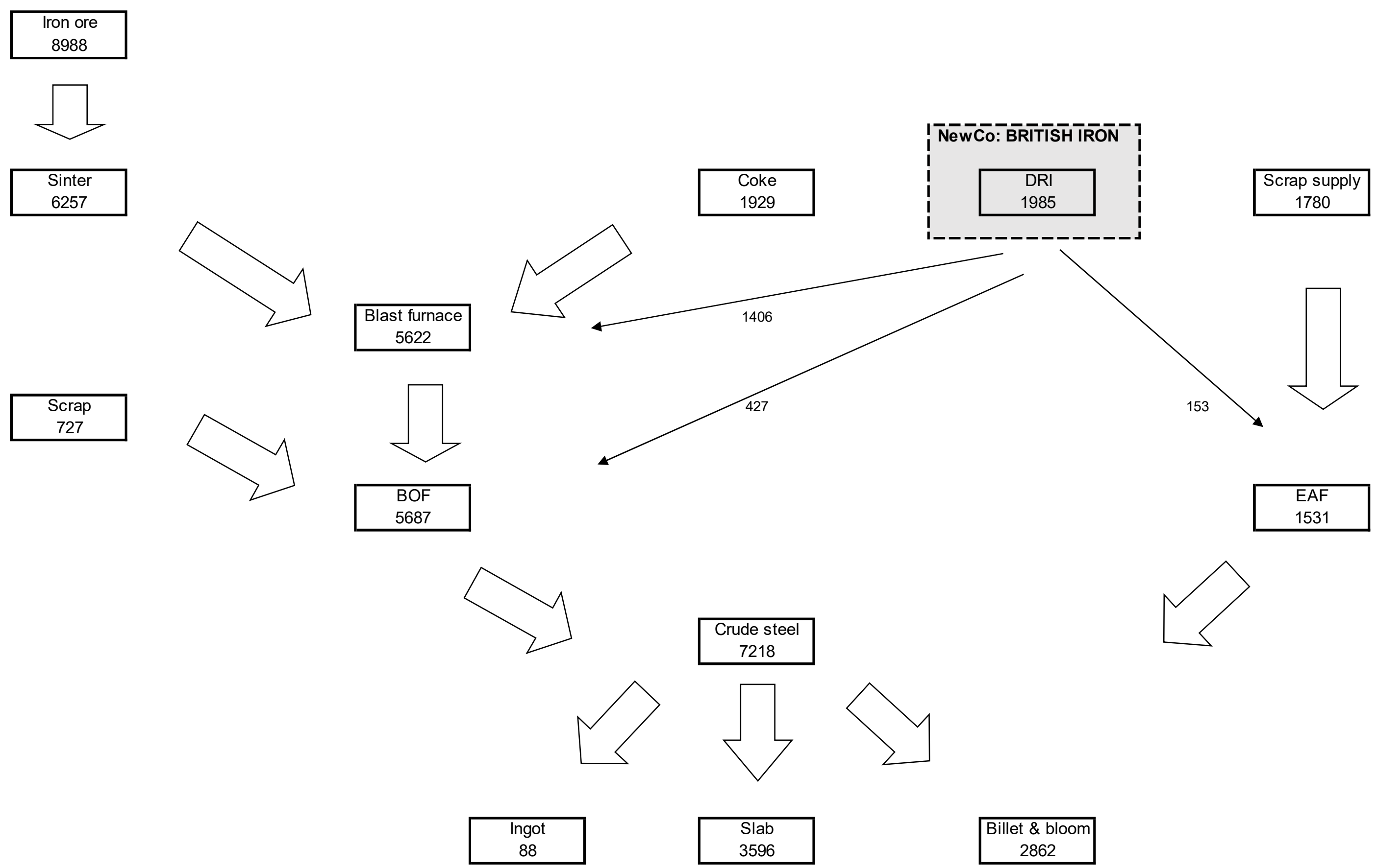
For further description, see Chart D overleaf.

[21] DRI can be flammable, especially if exposed to moisture. For avoidance of doubt, all references to DRI in this report actually refer to hot briquetted iron or HBI – a compressed form of direct reduced iron that is much less susceptible to combustion.
[22] We base this capacity calculation on the assumption that DRI could provide 25% of the iron unit charge to the UK's blast furnaces, as well as a 7.5% charge to BOF steelmaking, and a ~10% charge for EAF steelmaking.
[23] Source: MCI steel plant capex cost database https://www.steelonthenet.com/commerce/profiles/capex-data.html, assuming Midrex technology and natural gas energy feedstock.

APPENDIX 2: Vision of UK steel sector during transition, incl 'British Iron' (cont'd)

Chart D: UK steel flows in transition period with 2 mt / year DRI supply

Based on estimated 2019 production volumes†
Figures indicate flows in 000s tonnes



†: 2019 volumes are used, because 2020 volumes were distorted by the effect of the Coronavirus pandemic.
Source: Metals Consulting International Limited

APPENDIX 3: Vision of 'British High-Performance Steels'

The Liberty Speciality Steel Stocksbridge plant has a unique and specialist role in the UK steel sector. It produces ~0.3 million tonnes of high value alloy and stainless engineering steel for sectors that include aerospace, nuclear, defence, and oil and gas. Stocksbridge is currently supplied with ingots produced at Liberty Speciality Steels Aldwarke plant in Rotherham. These ingots are currently rolled into a variety of sections in the Stocksbridge Billet Mill.

Alternatively, at Stocksbridge ingot is remelted and refined in special furnaces to provide exceptional purity and performance. The rolled products produced at Stocksbridge require know-how that has been developed across generations; and which currently serves the essential industrial needs of UK and international manufacturing, including aerospace. The facility is one of the gems in the Liberty Steel portfolio. Indeed, only a handful of other European firms have the capabilities that exist at Stocksbridge. MCI has no doubt that the business could be turned into a champion of the UK manufacturing sector, if only it was not encumbered with the burdens of high energy costs and business rates.

Liberty Powder Metals is another gem in the Liberty Steel portfolio, with the pilot Teesside production plant (operating on the site of the Materials Processing Institute) supplying alloy steel, stainless steel and nickel-based alloy powders. These materials are used in new fast-growing high-tech industries such as additive manufacturing, metal injection moulding, laser metal deposition etc – industries that are likely to underpin much manufacturing growth in the North of England in the coming years.

Sheffield Forgemasters has unique equipment that enables it to produce specialised heavy forgings and castings. These products are used in numerous sectors that include naval and defence (including surface vessels and submarines), power generation and oil & gas. Forgings and castings from this firm are used in the generator systems for nuclear submarines. It is proposed to use similar products to produce Small Modular Reactors (SMRs) for civil nuclear power generation. These forgings and castings also serve critical industrial needs within the UK. The strategic importance of Sheffield Forgemasters has recently been demonstrated by the MOD agreeing to a £120m loan to enable the replacement of the 10,000-tonne press with a modern 13,000 tonne version.

Both Stocksbridge and Sheffield Forgemasters have unique and, in many ways, complementary specialised capabilities. There is a strong case for combining the two businesses. The former does not possess electric steelmaking facilities whilst there is an excess of electric steelmaking capacity at the latter. Thus, ingots for rolling and remelting could be supplied to Stocksbridge by Sheffield Forgemasters.

Because of high customer overlap, the Liberty Powder Metals Plant would also make a good fit with such a newly-merged business.

MCI tentatively name the newly merged entity 'British High-Performance Steels' (BHPS). An outline of the assets and business unit interdependencies within BHPS is illustrated in Chart E.

APPENDIX 3: Vision of 'British High-Performance Steels' (cont'd)

Given the strategic importance of BHPS, MCI propose that, as part of any new organisational structure, the British Government should retain a golden share in the new business, permitting some degree of Government control over critical commercial decisions.

APPENDIX 3: Vision of 'British High-Performance Steels' (cont'd)

Chart E: Schematic outline of British High-Performance Steels