

WHITE PAPER THE STEEL INDUSTRY SERIES PAPER 01 APRIL 2016

UK STEEL – IMMEDIATE NEEDS AND LONG TERM SUSTAINABILITY

Specialist steel manufacture and research facilities at the Materials Processing Institute

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The case for intervention in the wake of the announcement by Tata Steel is based on a sound economic rationale

Whilst it is usually preferable to allow the market to take its course, there are some issues, unique to the steel industry, that must be taken into account. Most relevant is that the cost of mothballing and reopening a steel plant is so great that commercial operators in the market will produce at below marginal cost, rather than reduce capacity. For this reason, it is wrong to presume that existing steel assets can be opened and closed in line with market demand, in the same way as most other manufacturing facilities. It is therefore imperative that if the plant operator, in this case Tata Steel, no longer requires a facility, that Government acts to ensure continued operation for a sufficient period to allow a new buyer to come forward. Given the complexity of steel transactions and based on historical transactions, it can be expected that this process would take up to two years. Many people have likened this situation to Government intervention in the banking crisis, but the temporary operation of the East Coast Mainline, when the existing operator, National Express, walked away from the franchise, is a more relevant example. It would have been damaging to the economy and to vital national infrastructure to allow the Mainline to close whilst seeking a new franchisee and the same argument applies in the case of steel assets.

Some may question why a steel industry is even of continued relevance in the context of a modern UK economy, but it is worth remembering that each adult in the UK consumes around half a tonne of steel per year, that steel is the most pervasive material on the planet, is essential for economic growth and without it our high value manufacturing sector could not exist. Steel rests in the collective imagination as a nineteenth century industry, but the catch all name of steel, describes a range of materials being manufactured today that did not even exist ten years ago. Steel production is knowledge and technology intensive, relying on close links with world leading universities and research institutions, such as the Materials Processing Institute. It is essential for manufacturers to be close to their source of steel supply to ensure that the latest innovations in their products, for example, innovation in automotive and aerospace, can be realised by the development of new steel alloys and processing techniques. We are fortunate in the UK that we have such a world leading steel industry, constantly developing new steel products to support our manufacturing base.

At the heart of the Tata Steel UK operations that have been put up for sale is the Port Talbot strip steelworks in South Wales. When contemplating intervention, Government and commentators alike are rightly concerned about the prospects of pouring taxpayers money into what they fear may be an unviable commercial enterprise. However, there is little evidence that this would be the case. The fundamentals for the Port Talbot facility show that it has been, and could be again, a world leading, high quality and low cost producer of steel. Port Talbot has some of the most advanced steelmaking equipment, an experienced workforce and a capability to make world leading steel qualities, for the most demanding applications.

In much the same way as Ford sold Jaguar Land Rover, after making significant investments, to focus on their core businesses, so Tata Steel has taken a rational strategic decision to concentrate its European operations at its JJmuiden facility in the Netherlands. As was the case for Jaguar Land Rover, different ownership, with a different strategy can give different results. Again there are fundamental similarities, with Port Talbot epitomising a UK brand in steel that is globally exportable and can attract a premium based on quality and customer service. It is a testament to the strong ethical culture within the Tata Steel organisation, that rather than close the UK facilities, they are offering them for sale, in the sure and certain knowledge that they will unleash a highly competitive new player on the European scene.

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A figure of £2M per day in losses has been widely guoted in the press as the requirement to keep the Port Talbot facility running, but without understanding the reason for these losses, or how they could be addressed. Put simply, it is all about economies of scale. Unlike many other industries, steel producers cannot decide to pursue a strategy of either low cost, or high quality. They must do both and as the latest steel products of today are quickly commoditised, it is a fallacy to suggest that a producer can make only high quality and high margin steels and continue to achieve the economies of scale required to run their operations. Sitting within the Tata Steel operations, Port Talbot is unable to achieve the economies of scale it needs, because Tata Steel needs to run its IJmuiden facility as a high productivity plant, whereas Port Talbot, with its lower cost base, can tolerate lower levels of productivity. This is a perfectly rational and appropriate strategic choice for Tata Steel. The opportunity for Port Talbot is that sitting outside such an internal market, the plant will have the opportunity to compete effectively across the European and global steel market, to achieve its own economies of scale and return to the high levels of profit it has historically achieved.

Aside from the essential role of UK steel in the UK economy, the need for sovereign capability in defence and the potential for the Port Talbot steelworks to compete effectively in the global steel market, there is another, greater prize to be won in the European race for supremacy in the industry. The steel industry is on the cusp of a paradigm shift in technology, moving from the large integrated, high economies of scale assets that exist, to a new mini-mill type operations. These new operations are based around Electric Arc Furnaces, they are high technology, high flexibility, low capital cost facilities, utilising 100% recycled raw materials and giving a step change improvement in carbon emissions.

The gradual decline of many existing steel assets is opening the door to the introduction of these new technologies and by having an environment in the UK that is open and welcoming to new investment in these steel producing technologies, it would be possible to capture the European market in steel production. The UK is ideally placed to be the leading nation in switching to this new technology. Having a large market and growing market for steel, a ready and available supply of raw material and, through universities and the Materials Processing Institute, the expertise and innovation capability to make this shift.

The UK is currently the fourth largest exporter of steel scrap in the world and the greatest exporter on a per capita basis. This is a valuable raw material, which, if retained and processed in the UK, becomes a high value export product, significantly improving the UK's balance of payments and providing a draw for inward investment in advanced manufacturing. Enabling the transition of the existing Tata Steel UK assets to new owners will support the development of the UK industry to lead on the investment in Electric Arc Furnaces and produce high quality, exportable steel products.

It is important to recognise that the UK is well placed to be the leading European nation in this switch to the new steel production technologies, but if investments are made first elsewhere in Europe, it would close the door to realising this technology shift in the UK. Inward investors are currently looking for opportunities to set up such facilities in Europe and if this were to happen in one of the other European nations we would see an increase of steel imports into the UK and a gradual shift of high value manufacturing from the UK to territories that can provide the advanced steels needed.

To support this essential shift in the UK industry, the Materials Processing Institute, along with its partners, TWI and the Institute of Materials, Minerals and Mining, have made a proposal to establish a new Materials Catapult for the UK. The proposal is currently under consideration by Government. The materials industries are currently not supported under the Government's catapult network, but they have specific innovation needs and are the essential underpinning of UK manufacturing. UK STEEL – IMMEDIATE NEEDS AND LONG TERM SUSTAINABILITY

The proposal partners have demonstrated strong crosssector industry support for the Catapult, including from leading industry bodies, such as CBI, EEF and FSB.

The Catapult will focus on improving productivity in the UK materials industries to keep them at world leading levels of competitiveness. It would provide the translational support for the commercialisation of research from UK universities, to ensure that the benefits are realised within the UK economy. The Government has announced investment of over £300M in materials research at the new Royce Centre at the University of Manchester, but without the Materials Catapult, the UK will not have the capability to bring this research to commercial reality and the benefits will be exploited elsewhere. Finally, it is recognised that there are a larger than average number of SMEs in the materials industries and the Materials Catapult partners have developed specific measures to help these SMEs grow and become the internationally competitive large businesses of the future.

In summary, some form of intervention may be required to ensure the continued operation of the Tata Steel UK assets, whilst a new buyer is found. The rationale for this can be purely economic, recognising the essential role that the steel industry plays in supporting UK manufacturing and the opportunity for the Port Talbot steelworks in particular to be an internationally competitive global steel player. Supporting this transition would enable the UK steel industry to springboard to a new asset configuration, based on 100% recycled, low carbon, high technology and flexible, min-mill type operations. A key enabler to make this happen is the proposed Materials Catapult, urgently called for across the UK materials industries and which could be implemented nationally, with immediate effect by the Materials Processing Institute and its partners.





Chris McDonald Chief Executive Officer Materials Processing Institute

Note: A concise version of this Paper was published as an op-ed in The Daily Telegraph on March 13th 2016 www.mpiuk.com/news-details.php?news_id=38



Chris McDonald is the Chief Executive Officer of the Materials Processing Institute, a not-for-profit industrial research Institute, supporting the materials, processing and energy sectors. Chris led the divestment of the Institute from its then parent company, Tata Steel, in 2014.

Chris's background is in industrial research and manufacturing, where he has worked internationally. A graduate from Cambridge University, Chris is a fellow the Institute of Chemical Engineers and of the Institute of Materials, Minerals and Mining. He sits on industrial advisory boards at a number of universities, including Oxford and Sheffield and is an associate faculty member at the University of Warwick.

Chris has an interest in innovation management and industry dynamics. He provides expert opinion and support to companies, institutes and government organisations on innovation strategy & management to support growth and inward investment. He is often called to commentate in the media on innovation leadership and the steel industry. A graduate from Cambridge University, Chris is a fellow the Institute of Chemical Engineers and of the Institute of Materials, Minerals and Mining 9 9



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Materials Processing Institute

The Materials Processing Institute is an independent, open access and not-for-profit technology and innovation centre working with industry, government and academia worldwide. Support ranges from small scale, site based investigations, through to long term collaborative research programmes.

The Materials Processing Institute has expertise in materials, materials processing and energy, specialising in challenging processes, particularly those involving high specification materials, high temperatures and difficult operating conditions.

The Institute has over 70 years' experience as a leading UK technology provider. Extensive materials processing knowledge is supported by state-of-the-art facilities with a broad range of equipment, from laboratories through to demonstration, scale-up and production plant.

Scientists and engineers work with industry and apply their expertise to develop and implement robust solutions to research and development and improvements for products and processes

Expertise is spread across a wide range of disciplines, including:

- Materials Characterisation, Research and Development
- > Simulation and Design
- Monitoring, Measurement and Control in Hostile Environments
- > Process Development and Upscaling
- > Specialist Melting and Steel/Alloy Production
- > Engineering
- > Materials Handling
- > Minerals and Ores

Research and project management teams deliver support across a wide range of industrial and manufacturing sectors including:

- > Metals and Metals Manufacture
- > Chemicals and Process
- > Nuclear
- > Oil & Gas
- > Energy
- > Aerospace and Defence
- Mining and Quarrying



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