

# Making a difference



Chris McDonald,  
CEO MPI

High energy costs, a strong pound, cheap Chinese imports – all big issues for Western European steelmakers – but Chris McDonald, CEO of the UK-based Materials Processing Institute, argues that if producers can offer low cost, high quality products and the best customer service on the planet, they've won the battle. By **Matthew Moggridge\***

"If we're going to bring the developing world out of poverty we can only do that with steel," said Chris McDonald, chief executive officer of the Teesside-based Materials Processing Institute (MPI). "Steel is absolutely essential to sustain human life and human existence," he added, "but the industry is often trapped in a business model that is very difficult to make money from, so it's very interesting for me to hear from people with ideas to do things differently."

Steel Times International met McDonald a few days after SSI UK announced that it had gone into liquidation – and months prior to the recent announcement by Tata Steel (in March this year) of its intention to withdraw from the UK.

For McDonald all major UK steel producers are facing difficulties involving soaring energy prices and a strong pound. He is fully conversant with the view that a level playing field is a pre-requisite going forward, but is more concerned with what the steel companies can do for themselves. "And there is quite a lot we can do collectively as an industry," he said.

## Low cost and high quality

According to McDonald, it is all about where you can make a difference and what you can do to influence the margin. "There aren't so many big levers you can pull, but what you can do is innovate faster than your competitor. That's kind of obvious, but what concerns me is that, sometimes, steel companies are trapped in 'Porterian' management economics.

Porter said there are two strategies a company can have: lowest cost or best quality. In the steel industry, that's too simplistic, as you don't have that choice. "You have to be the highest quality and the lowest cost at the same time and I am concerned when I see a steel company that thinks it doesn't have to worry about cost or volumes as a proxy for costs. Focusing on quality alone is not enough as a steel company is much more complex. They have to offer low cost, high quality and best customer service and in those three areas there's plenty of room for innovation," he said.

McDonald cited Austrian steelmaker Voestalpine: based in Linz, accessible

only by river and producing steel in small batch sizes. "By all the laws of economics it shouldn't work, but they run the plant flat out so they get low cost; they produce high quality steel and they deliver excellent customer service – and that's about constant and continual innovation in those three areas," he said.

"To be a successful steel company in the UK you don't have to be better than the steel company in China, you have to be better than the steel companies in the Netherlands, France and Germany – you compete with the other guys in the high cost locations."

McDonald argues that the macro stuff – the elusive 'level playing field' and business rates – are for UK Steel and the EEF who lobby and attempt to influence UK government policy. While steel companies should engage with the lobbying process, it's very difficult to make a case to politicians if you're not doing everything you can in your own back yard. "In the UK there is public funding available to support innovation. How many steel companies are accessing it? Or, if they're having difficulty

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accessing it, how are they making that case back to government?" asks McDonald.

He urges British steelmakers to benchmark their processes with other companies and be active on international committees. He stresses the importance of networking and drawing information back into their own businesses and then innovating from that point onwards. "And if businesses are doing that they've got a really strong case for lobbying – and if they're not they are immediately on a back foot," he said.

### The narrative of decline

McDonald believes it is easy to be obsessed by the narrative of decline in the steel industry. "What people are generally looking at is the number of people employed and if you look at international

to invest in a country where it can't buy raw materials. If you're a hi-tech manufacturer you need a secure supply chain and you need to work with your supplier to innovate," he said.

He cited the car industry as an example of how manufacturers and the steel industry work closely together on new grades of steel. "If the steel industry isn't local, the whole supply chain collapses. Maybe it's not possible to fundamentally fix this problem, but if it's not there and the rest of the supply chain collapses, we have a massive economic problem," he said.

### Creating value

Having a steel industry purely as a matter of national pride is nonsensical when the only reason to have one is because it adds a massive amount of value to the economy.

doesn't exist yet to enable the steel industry to meet stringent EU emissions targets.

"It all comes down to finance," McDonald said. "Steelmakers could switch tomorrow to an industry that's based entirely on electricity generated by nuclear power stations – then there would be zero carbon emissions. So I think it's a bit of a simplification to say that the technology isn't there – technology comes at a price."

Policy makers and industry, he argued, should put their heads together, agree on essential targets and achievable timescales and then develop the technological implementations to take things forward. "A target developed in collaboration with industry is far more likely to succeed than a target issued by diktat," McDonald said.

### Industry know-how

He argues that, during discussions with the UK government around the Kyoto protocol, there was a real danger that carbon emissions targets were going to be set for the steel industry that were way below the level of what was thermodynamically achievable. "But by lobbying and discussion and debate we reached a position that was more sensible. So you could say that's democracy in action, that's the way it's supposed to work. What I would like to see is more people in those positions who maybe have a scientific and technical background," he said.

"I want to demand more of politicians and civil servants and I think we need to give more in order to bridge the gap and explain how important the material is, how essential it is, and identify the issues surrounding it," McDonald said.

That Europe must take action on carbon is a no-brainer, but not unilateral action, said McDonald. "Action must be taken, but it needs to be globally co-ordinated or the European industry needs to find a way to produce low carbon electricity that is internationally competitive. So there's kind of a nice sweet spot there where MPI makes a technology intervention that benefits the competitive position of the industry," he explained.

McDonald argues that almost every project MPI engages with results in an energy benefit to the company concerned. "Anything that gives an energy benefit, gives a CO<sub>2</sub> benefit, so it's really driving towards that sweet spot," he said.

"Before the idea of carbon reduction became such an imperative, we could



Students from Leeds University visit MPI's Teesside headquarters in the UK

statistics, particularly for the UK from the 1970s to the present day, it's pretty much a straight line graph with the exception of the financial crisis," he argued. "It demonstrates that the industry is continuing to invest in new and more efficient ways of making steel and yes, that results in fewer people being employed."

The steel industry, said McDonald, invests in greater efficiency, but fails to capture the value itself. It immediately passes it on to the customers and that is why the steel industry pursues a productivity curve, invests in new technology, becomes increasingly 'hi-tech' but fails to make money because the value is passed further into the supply chain.

There was something spookily prescient about his next comment, bearing in mind recent events in Port Talbot. "We should all hope that there is not a fundamental collapse in the steel industry in the UK because if the steel industry collapses, the UK will lose its manufacturing economy and there is no reason for any outside investor

"Not directly through the people it employs, but indirectly through the value it creates in the supply chain," McDonald continued.

"Value cannot be measured in terms of the profitability of the steel company because it's very difficult for a steel company to make a profit, but it's seen everyday in the profitability of companies in the aerospace industry, engineering, defence and so on," he said. "That's why a developing nation feels it must have a steel industry, because it can't have a thriving economy without one."

EUROFER, the European Steel Association, has argued that the greatest test for the steel industry going forward is the need to secure continued and adequate financing for investment into the deployment of much-needed technologies for reducing CO<sub>2</sub> emissions.

Gordon Moffat, a former director-general of EUROFER, once commented in *Steel Times International*, "You cannot have targets without technology" referencing the EU ETS and arguing that the technology



point to a whole range of products that just happened to do that because the three main drivers in terms of process development for the industry, are: reduction of energy; reduction of raw materials; and improvement of yield, all of which reduce cost and carbon emissions," he said.

### More effective communication

McDonald is often frustrated by the way the steel industry fails to communicate the cutting edge nature of its production technology. "The steel industry has a lot to teach other industries about how to be more efficient and it can drive a lot of innovation, but the onus is on us to be effective communicators," he said.

Describing steel as 'a smokestack industry' is appalling to McDonald. "It's pretty poor to have to say: 'here is an industry that is essential for our quality of life, but somehow we find it slightly distasteful'. But if we adopt the world's best practice, then this need not be considered a smokestack industry," he said.

The industry has been hard at work dispelling the 'smokestack' myth and working on new and radical technologies. For McDonald, collaboration is crucial, as an individual or a single company cannot solve the problems.

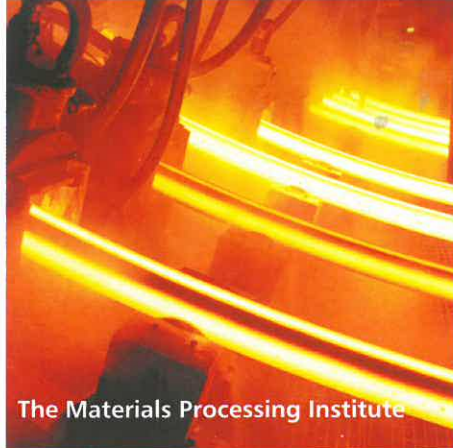
In addition to what McDonald calls the historic centres for innovation – Japan, South Korea, the UK and the super universities – MPI works closely with its European partners and the respected metallurgical institutes of Eastern Europe.

Low capital-intensive solutions are the way ahead for new and radical technologies. "Nobody will ditch a £3 billion steel plant to build another one for a marginal increase in productivity," he said, explaining how making continuous improvements to existing technology is the way ahead.

### Emissions reduction

Viewing emissions as a valuable resource is important and there are ample opportunities, claims McDonald, for existing steel plants to be fitted or retro-fitted with technology that derives value from waste streams. MPI was working on numerous projects and not only those concerning gas emissions but also solids and liquids.

"Steel plants produce a lot of low grade waste heat which they can't use. We can think of many opportunities to use that low grade waste heat by transforming it into



The Materials Processing Institute

The UK-based Materials Processing Institute (MPI) is all about doing things differently through the use of innovation and technology. It provides industrial research and development services to industry.

Established in 1944, a key function of MPI is to help business enterprises bring their technology to market. It has a strong reputation as a steel research centre and has identified some clear areas where there are applications it can support in the energy and metal processing sectors.

Around 90% of MPI's £6.5 million turnover comes directly from industry and steel accounts for 50% of its activities.

MPI harbours ambitions to become part of the UK's network of 'Catapult Centres'. Catapult Centres are designed to transform the UK's capability for innovation in specific areas and help drive future growth.

MPI has established strong links with Rolls Royce and Land Rover – key players in the automotive and aerospace sectors – and is currently working directly with the former.

For further information, log on to [www.mpiuk.com](http://www.mpiuk.com)

electrical power or transferring it directly to an adjacent industry," McDonald said.

### The Hlsarna project

The well-documented Hlsarna project, based on high smelt technology developed in Australia and a cyclone converter furnace developed in Western Europe, produces iron without the need for pellets, sinter or coke production and thus reduces the amount of CO<sub>2</sub> produced. "It stands every chance of being successful," according to McDonald. "And there are clear CO<sub>2</sub> benefits with or without carbon capture, but a steelmaker is unlikely to dismantle a blast furnace to install a Hlsarna plant."

It would be unlikely for Hlsarna technology to be implemented in Europe, but it could appear in Brazil or Iran. "Let's not forget that the Chinese have doubled

the size of the steel industry in 10 years based entirely on conventional technology," he said. "So that conservative nature of the industry means that it could be difficult for such technology to be adopted."

### Carbon Capture and Storage

McDonald believes that carbon capture and storage (CCS) is not an unreasonable thing and would be a good mid-term goal for the steel industry, paving the way for carbon capture and utilisation (CCU). "Maybe the steel industry would evolve to a position where it doesn't use carbon as a reductant, but then we're talking about electrolysis or hydrogen reduction and they are generations away," he said.

### Smart manufacturing

McDonald is pro-smart manufacturing, arguing that the steel industry generates an overwhelmingly large amount of data. "A lot of what we want to achieve from a 'factory of the future', such as late-stage customisation and added value, are all possible and, to a great extent, happen because they're driven by the normal drivers of reducing cost and adding flexibility. But they're not talked about in those terms, so some of it is about shifting the language. If we can get the steel industry to understand that some of the things they're doing, or want to do, fit really well into that agenda, then there would be an increasing chance of a buy-in," he said.

McDonald wants to be optimistic about the European steel industry, but he is only too aware of the different scenarios that could be painted for the future. "We could be in a position where Europe is almost entirely dependent upon steel imports – which would solve China's overcapacity problem – and there are people who regard this as a valid strategy. I think it is an unsustainable argument."

McDonald believes that achieving a level playing field in Europe is 'incredibly difficult' and argues that the chips are stacked against the industry for many reasons, including the much maligned EU State Aid Rule, which makes it harder for the British Government to bail out Tata Steel UK.

"You have two choices: throw up your hands and walk off the stage – go work somewhere else – or say, 'is there anything I can do?' And the answer is yes, there are many opportunities for innovation and intervention around quality, service and cost," McDonald concluded. ■