Materials Processing Institute

# THE CIRCULAR ECONOMY AS AN OPPORTUNITY FOR THE UK METALS SECTOR

A speech given at the opening of the UKRI Centre for the Circular Economy
Brunel University, London.

10 May 2021

Materials Processing Institute

## Introduction

Thank you to Mark Miodownik and thank you to Professor Fan and the team here at Brunel University, for inviting me to speak at the launch of this important, new UKRI Interdisciplinary Centre for Circular Economy in metals. My background is in steel and in fact I have spent my entire career working in the metals sector and during that time I have had the pleasure to get to know Professor Fan and to appreciate the tenacity with which he has built a great capability at Brunel, first in light metals and now focussing on the circular economy. I think that all of us active in metals technology and research in industry must be grateful to Professor Fan, Brunel University and UKRI, for their ongoing commitment to research in this vital area.

## A Powerful Combination of Capabilities

I am the Chief Executive Officer of the Materials Processing Institute, which is the UKs national centre for the development and scale up of new technologies for the steel and metals sector. At the Institute we have four areas of research interest: advanced materials, digital technologies, industrial decarbonisation and, of course, the circular economy. Just as Professor Fan and his colleagues carry out fundamental and early stage development activity, so it is our job to do the necessary upscaling innovation and commercialisation, to bring this great investment in research to its economic potential in industry. To support this, the Institute was recently awarded £22m of funding by the government, through InnovateUK which is part of UKRI, to support the UK steel and metals sector and this is now available for us to work with UK based companies.

As such, the Centre for the Circular Economy here fills a vital gap in national capability and that by building on our existing strong relationship and working together, Brunel and the Materials Processing Institute represent a powerful combination of capabilities that will enable us, as a United Kingdom economy, to take research ideas from the fundamental stage, right through development and application, in partnership with industry, as never before.

## The Importance of Metals

I am also though the chair of the UK Metals Council, this is the body that links the 11,000 or so businesses in the UK Metals Sector directly with government and with one another. In this role, I have seen just how important an industrial sector metals is to the UK. The industry directly employs a quarter of million people, with another three quarters of a million jobs relying on it it. The sector makes a contribution of almost £11bn per year in GDP and yet, very few metals industry companies are household names.

There are two reasons for this. First, many businesses in the sector are small businesses, important as they are in their local communities, they can be highly specialised advanced casting, forming, or coatings businesses, but rarely garner national attention.

Secondly, metals businesses are vital lynch pins in our industrial supply chains, but they do not produce consumer products. Instead they make the materials for the components from which the household names make their products. It is for this reason that the health and sustainability of the UK metals sector, is vital for our advanced engineering, rail, aerospace and automotive sectors. The green industrial revolution will be built on metals intensive technologies, such offshore wind, nuclear, electric vehicles and more.

## Opportunity for the Metals Sector

Why is it then that a circular economy centre is so vitally important to the UK metals industry and as a consequence to the wider UK economy and to the country as a whole? There are several clear reasons why the circular economy presents major opportunities for the UK metals sector:

> **SUSTAINABILITY**

The first opportunity is one of environmental sustainability and resource efficiency that meets Britain's ambition to be a global leader in decarbonising technologies and – where my institute is also thinking – the role our industries can play to support the UK's hosting of COP26 in Glasgow later this year. Utilising recycled metal means that less virgin ore needs to be mined. This creates an environmental benefit at the mine, but there is also an environmental benefit from the processing, with less energy generally required for recycling, rather than smelting and refining. This does though create a series of research questions around the recyclability of different metals, technologies for sorting and separation, as well an understanding of the product and applications performance for products produced from recycled materials versus virgin ore.

> **ETHICS**

There is a second opportunity in the reduction of mining, in that some metals are sourced from locations around the world where the proceeds of the mining industry are used to prop up undemocratic and exploitative regimes and where workers are poorly treated, child labour blights the lives of millions and modern slavery also persists. For too long Western consumers have been able to turn a blind eye to the consumption of materials produced overseas in ways that would not be acceptable at home. A circular economy approach gives the opportunity for consumer and producer choice and competition, with the opportunity to drive up ethical standards and the working conditions in the materials supply chain.

> **SOVEREIGN SECURITY**

This reduction in our reliance on international materials supply chains is also an important consideration for our sovereign security & capability. At times of increasing geopolitical tensions and with the security of materials supply seen as vital to national interests, it is worrying to see how many metals vital for our future are now listed as having a supply risk. If anyone doubts the vulnerability here, we saw recently with the blockage in the Suez Canal, how quickly international supply chains can empty as just in time deliveries dry up. Investing more in our circular economy will provide a degree of resilience to UK manufacturing and infrastructure projects, as well as reducing our political dependence on interests that dominate the production of certain metals.

> **GREEN INDUSTRIAL REVOLUTION**

Increasing the circularity of metals will also be vital for delivering the Green Industrial Revolution. New green technologies, whether for electrification, energy generation, or associated infrastructure, all need metals. It is also true that as we seek to eliminate carbon emissions, not only are we investing in renewing our manufacturing base and adding new infrastructure, but there is a strong environmental case for metals to be favoured above other materials, such cement for instance, where this is possible. As a consequence, the drive to eliminate carbon, whilst it might result in greater materials efficiency in the long term, will also result in a short-term surge in materials demand and a greater shift towards metals within that.

> **GO SMART AS WELL AS GREEN**

My final point on the benefits to the metals industry in achieving a circular economy approach is that going green in this way, inevitably means going smart too. The UK economy as a whole has had stagnating levels of productivity since the financial crisis, but we are now seeing the emerging, new digital technologies of the 4th industrial revolution moving out of the laboratory and on to the factory floor. Investing in a circular economy approach within the sector, gives us the opportunity to simultaneously invest in automation and new ways of working and so go smart and go green at the same time, driving up productivity and increasing the sustainability of the sector and the jobs and communities that rely on it.

## Opportunity for the UK

It can be understood from these areas of supply chain security, sustainability & ethics, increasing productivity and achieving a green industrial revolution, that the opportunity for the circular economy is of direct benefit to the metals sector, but also presents far reaching opportunities for the wider UK.

It is though useful to understand that this country is almost uniquely placed to benefit from this circular economy approach. Having been at times the most industrialised nation on Earth and having retained a strong manufacturing economy with advanced supply chains, this means that we have an abundance of available raw materials, combined with the industrial base capable of utilising it. We must also recognise that to make this a success will also require our talented researchers, engineers, industrialists and innovators, at centres such this, at my own Institute and in our excellent foundries, forges and furnaces, throughout the whole of the UK.

It is by working together in partnerships such as those represented by this centre, that we can reap the benefits in industry, in developing key technologies for the future, in our communities and environmentally, of a circular economy approach to metals.

Thank you.

Materials Processing Institute

**Chris McDonald** is the Chief Executive Officer of the Materials Processing Institute. The Institute carries out industrial research and innovation in advanced materials, industrial decarbonisation, digital technologies and the circular economy supporting the materials, processing and energy sectors for over 75 years. Chris led the divestment and return to independent, not-for-profit ownership of the Institute in 2014.

Chris's background is in industrial research and manufacturing, where he has worked internationally. A graduate of 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.

Chris has an interest in innovation management and industry dynamics and in addition to leading the Institute, he provides expert opinion and consultancy support to companies, institutes, Governments and public bodies in innovation and technology strategy and management. He also advises on the technical due diligence aspects of mergers and acquisitions.

Chris is prominent in the development of public policy, around innovation, steel, SMEs, where he works to support growth and inward investment. Chris is the policy chair for Innovation and Enterprise for the Federation of Small Businesses, a member of the CBI Regional Council and Shadow Monetary Policy Committee for the North East, the Chair of the UK Metals Council and a member of the Steel Advisory Board for UK Steel (EEF).

Chris is often called to commentate in the media on innovation leadership and the steel industry.

“Chris is often called to commentate in the media on innovation leadership and the steel industry”

Chris McDonald
Chief Executive Officer
Materials Processing Institute

Materials Processing Institute

# 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 is expert in advanced materials, industrial decarbonisation, digital technologies and the circular economy, specialising in challenging processes, particularly those involving high specification materials, high temperatures and difficult operating conditions.

The Institute has over 75 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 / Asset Management
- 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

Materials Processing Institute

Materials Processing Institute
Eston Road
Middlesbrough
TS6 6US
United Kingdom

+44 (0)1642 382000
enquiries@mpiuk.com
www.mpiuk.com

1944 - 2019
75
YEARS OF INNOVATION

SPEECHES 10/05/2021