Materials Processing Institute

RESOURCE EFFICIENCY AND NET ZERO

A speech given at the All Party Parliamentary Group (APPG) for the Environment, Westminster.

Tuesday 15 June 2021

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Introduction

Thank you to the members of the APPG for the Environment, for the invitation to speak this afternoon about resource efficiency and net zero.

I am the Chief Executive Officer of the Materials Processing Institute, which for the last 75 years has been the UK's national centre for innovation in steel and metals. Our role is to commercialise technology for industry and our research focus areas include industrial decarbonisation and the circular economy, alongside digital technologies and advanced materials. We are currently delivering a £22m innovation programme in this area, known as PRISM, that was announced by the chancellor in the March 2020 budget and is funded through InnovateUK.

I am also the chair of the UK Metals Council, one the 14 industrial sector councils that connect industry with government.

My focus today is on improving resource efficiency through a circular economy approach, particularly for metals and how this provides benefits that go beyond net zero, to include ethics and sovereign security.

Metals have an almost limitless capability for recycling. Steel in particular has many inherent properties that mean that recycling is usually synonymous with upcycling, as scrap steel is transformed into increasingly high performance and advanced products. Recycling is also intrinsically more environmentally friendly. Mining accounts for 10% of world energy consumption and the more we recycle, the less we need to mine. Even leaving mining aside, for steel switching from primary production to recycling leads to an 85% reduction in carbon dioxide emissions.

A second benefit is that some metals are sourced from locations around the world where the proceeds of the mining industry prop up undemocratic and exploitative regimes, where workers are poorly treated, child labour blights the lives of millions and modern slavery 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, to drive up ethical standards and working conditions in the supply chain.

This reduction in our reliance on international supply chains is an important consideration for our sovereign security. With increasing geopolitical tensions and the security of materials 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 our vulnerability think how the blockage in the Suez Canal quickly emptied international supply chains. The circular economy provides resilience to UK manufacturing and infrastructure projects.

Increasing the circularity of metals is also vital for delivering the Green Industrial Revolution. New technologies for electrification, energy generation and associated infrastructure, all need metals. There is a strong environmental case for metals to be favoured above other materials where this is possible. As a consequence, the drive to eliminate carbon will result in a in materials demand and a greater shift towards metals.

My final point 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 UK. This country is almost uniquely placed to benefit from a circular economy approach. Having been at times the most industrialised nation on Earth and having retained a strong manufacturing economy with advanced supply chains, 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 require our talented researchers, engineers, industrialists and innovators, at centres such my own Institute and in our excellent foundries, forges and furnaces, throughout the whole of the UK.

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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.

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Chris McDonald
Chief Executive Officer
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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

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