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Details of Grant

EPSRC Reference:	EP/V011804/1			
Title:	UKRI Interdisciplinary Centre for CircularMetal			
Principal Investigator:	Fan, Professor Z			
Other Investigators:	Chang, Professor IT	Calzadilla, Dr A	Mendis, Dr CL	
	Patel, Dr JB	Godsell, Professor J	Ceschin, Dr F	
	Montana, Professor G	Hall, Dr R	Harrison, Professor D	
	Li, Dr Z	Miodownik, Professor M	Wang, Professor Z	
	Cantor, Professor B	Scamans, Professor GM	Bleischwitz, Professor R	
Davis, Professor C				
Researcher Co-Investigators:				
Project Partners:	Aeromet International plc	Aluminium Federation Ltd	British Steel Ltd	
	Chinalco Materials Application Research	Circular Economy Club	Coca-Cola European Partners	
	Constellium	CROWN Technology	Defence Science & Tech Lab DSTL	
	GEFCO UK Ltd	Giraffe Innovation Ltd	GKN	
	Innoval Technology Ltd	KTN	Liberty Steel UK	
	Materials Processing Institute (MPI)	Metal Packaging Manufacturers Associatio	MQP Limited	
	Oakdene Hollins Ltd	Pinsent Masons LLP	Recycling Lives	
	Shanghai Jiao Tong University	Supply Dynamics	Tata Steel UK Limited	
	The Manufacturing Technology Centre Ltd	UK Metals Council	WRAP	
	Department:	BCAST		
	Organisation:	Brunel University London		
	Scheme:	Standard Research		
Starts:	01 January 2021	Ends:	31 December 2024	
		Value (£):	4,437,440	
EPSRC Research Topic Classifications:	Industrial Organisation (R&D)		Manufact. Business Strategy	
	Manufacturing Machine & Plant		Materials Processing	
EPSRC Industrial Sector Classifications:	Transport Systems and Vehicles		Manufacturing	
Related Grants:				
Panel History:	Panel Date	Panel Name	Outcome	
	06 Sep 2020	UKRI Circular Economy Centres Interview Panel	Announced	
	19 Aug 2020	UKRI Circular Economy Centres Sift Panel	Announced	
Summary on Grant Application Form				
<p>Historically, the discovery, development and application of metals have set the pace for the evolution of human civilisation, driven the way that people live, and shaped our modern societies. Today, metals are the backbone of the global manufacturing industry and the fuel for economic growth. In the UK, the metals industry comprises 11,100 companies, employs 230,000 people, directly contributes £10.7bn to the UK GDP, and indirectly supports a further 750,000 employees and underpins some £200bn of UK GDP. As a foundation industry, it underpins the competitive position of every industrial sector, including aerospace, automotive, construction, electronics, defence and general engineering. However, extraction and processing of metals are very energy intensive and cause severe environmental damage: the extraction of seven major metals (Fe, Al, Cu, Pb, Mn, Ni and Zn) accounts for 15% of the global primary energy demand and 12% of the global GHG emission. In addition, metals can in theory be recycled infinitely without degradation, saving enormous amounts of energy and CO2 emission. For instance, compared with the extraction route, recycling of steel saves 85% of energy, 86% GHG emission, 40% water consumption and 76% water pollution. Moreover, metals are closely associated with resource scarcity and supply security, and this is particularly true for the UK, which relies almost 100% on the import of metals.</p> <p>The grand challenge facing the entire world is decoupling economic growth from environmental damage, in which metals have a critical role to play. Our vision is full metal circulation, in which the global demand for metallic materials will be met by the circulation of secondary metals through reduce, reuse, remanufacture (including repair and cascade), recycling and recovery. Full metal circulation represents a paradigm shift for metallurgical science, manufacturing technology and the industrial landscape, and more importantly will change completely the way we use tural resources. Full metal circulation means no more mining, no more metal extraction, and no more primary metals. We will make the best use of the metals that we already have.</p> <p>We propose to establish an Interdisciplinary Circular Economy Centre, CircularMetal, to accelerate the transition from the current largely take-make-waste linear economy to full metal circulation. Our ambition is to make the UK the first country to realise full metal circulation (at least for the high-volume metals) by 2050. This will form an integral part of the government's efforts to double resource productivity and realise Net Zero by 2050. We have assembled a truly interdisciplinary academic team with a wide range of academic expertise, and a strong industrial consortium involving the full metals supply chain with a high level of financial support. We will conduct macro-economic analysis of metal flow to identify circularity gaps in the metals industry and to develop pathways, policies and regulations to bridge them; we will develop circular product design principles, circular business models and circular supply chain strategies to facilitate the transition to full metal circulation; we will develop circular alloys and circular manufacturing technologies to enable the transition to full metal circulation; and we will engage actively with the wider academic and industrial communities, policy makers and the general public to deliver the widest possible impact of full metal circulation. The CircularMetal centre will provide the capability and pathways to eliminate the need for metal extraction, and the estimated accumulative economic contribution to the UK could be over £100bn in the next 10 years.</p>				
Key Findings				
This information can now be found on Gateway to Research (GtR) http://gtr.rcuk.ac.uk				
Potential use in non-academic contexts				
This information can now be found on Gateway to Research (GtR) http://gtr.rcuk.ac.uk				
Impacts				
Description	This information can now be found on Gateway to Research (GtR) http://gtr.rcuk.ac.uk			
Summary				
Date Materialised				
Sectors submitted by the Researcher				
This information can now be found on Gateway to Research (GtR) http://gtr.rcuk.ac.uk				
Project URL:				
Further Information:				
Organisation Website:	http://www.brunel.ac.uk			