

WELCOME TO THE INSTITUTE OF  
MATERIALS, MINERALS AND MINING

# LIGHT METALS DIVISION

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The Institute of Materials,  
Minerals and Mining

The global network for the materials cycle

## Vision

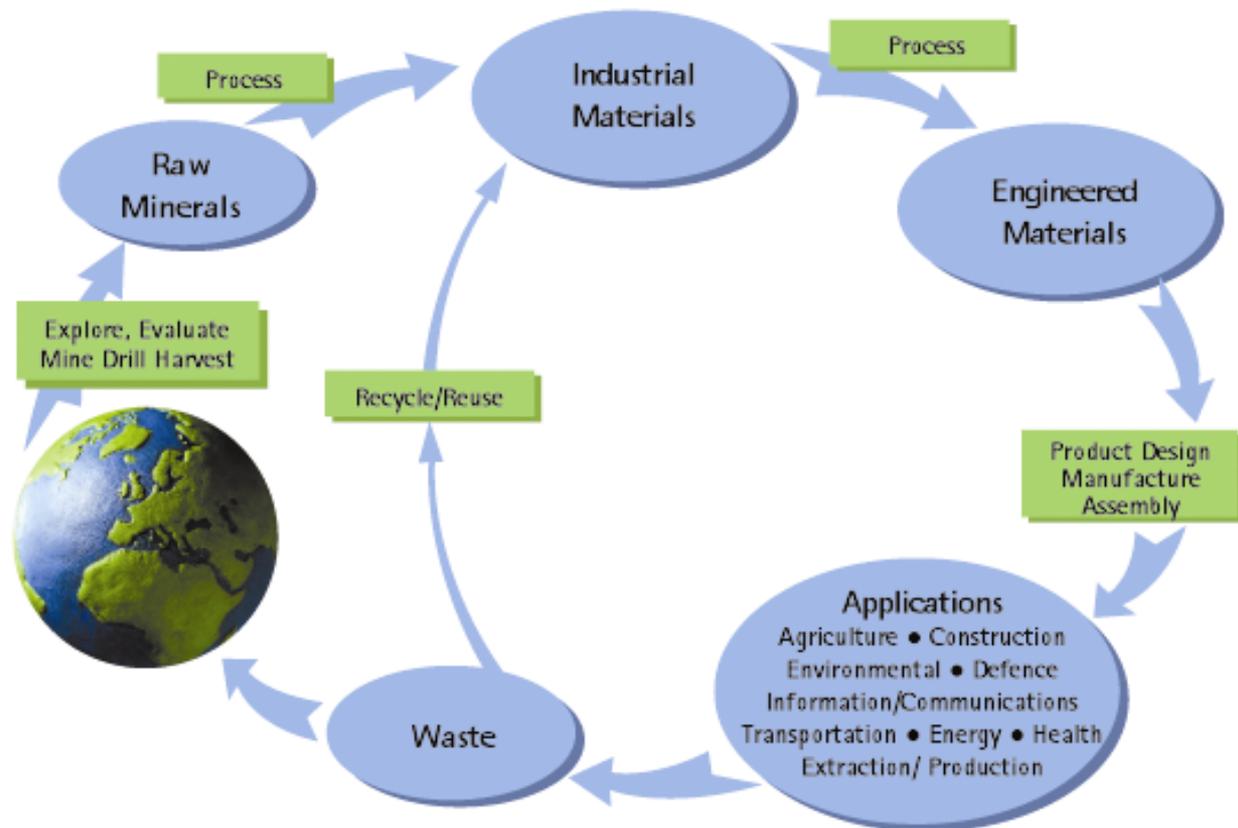
To be recognised as the global leader for professionals involved with the materials cycle.

## Mission

To promote the science, design, engineering and technology of materials, minerals and mining and their practical applications.

To facilitate qualifications, professional recognition and development, and to deliver knowledge, information and networking services to a global membership and wider community.

# The Materials Cycle



# IOM3 – Vital Statistics at a Glance\*

- 17000 members
- 200 industry members
- 350 school members
- 50 members of staff
- 3 UK facilities
- 60 local groups
- 8 overseas groups
- £6 million turnover



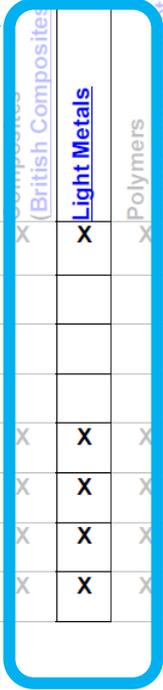
\* information taken from 2012 presentation

# IOM3 – Technical Communities



# IOM3 – Technical Communities

 The Institute of Materials, Minerals and Mining		INDUSTRY AND TECHNOLOGY POLICY BOARD																
		TECHNICAL GROUPS																
MATERIALS CYCLE		MULTIDISCIPLINARY GROUPS																
		Sustainable Development - Energy Materials - Construction Materials - Natural Materials																
		IMMA International Mining and Minerals Association																
		<u>Applied Earth Science</u>	<u>Mining Technology</u>	<u>Minerals Processing and Extractive Metallurgy</u>	<u>Oil &amp; Gas</u>	<u>Materials Science and Technology</u>	<u>Casting</u>	<u>Surface Engineering</u>	<u>Ceramics (The Ceramics Society)</u>	<u>Composites (British Composites Society)</u>	<u>Light Metals</u>	<u>Polymers (The Polymer Society)</u>	<u>Iron and Steel (The Iron and Steel Society)</u>	<u>Automotive</u>	<u>Biomedical Applications</u>	<u>Functional Materials</u>	<u>Packaging (The Packaging Society)</u>	<u>Wood (The Wood Technology Society)</u>
Materials Research and Development	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Exploration	X	X		X				X	X								X	X
Mining/Quarrying/Extraction	X	X	X	X				X	X									
Minerals Processing	X	X	X	X				X	X				X					
Materials Processing		X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Manufacture/Finishing				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Products/Applications	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Recycling and Sustainability	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X



# IOM3 – Strategic Themes



IOM3 themes: moving people



IOM3 themes: protecting the planet



IOM3 themes: healthy happy people



IOM3 themes: powering the planet

## Stand Out Themes from LMD Strategy Meeting on 12/12/13

- Overall the requirement for lightweight structures in all forms of transport means there is a massive opportunity for light metals, particularly for automotive and aerospace applications.
- The size of the potential market over the next few short years is larger than the market in these areas to date. The opportunities in these areas are particularly strong for aluminium and titanium.

# Aluminium

- The requirements for aluminium in the automotive and aerospace markets are much more similar than have previously been identified and there is significant potential for synergy between these two markets and technologies
- The major area of concern highlighted was the requirement for a UK-based metallic wing project. Presently, although the composite wing programme is strongly supported in the UK, this is far from the case for the metallic wing.
- Closed-loop recycling as demonstrated by the aluminium beverage can must be realised for end-of-life automotive vehicles and aeroplanes. Aluminium alloys must be developed that are suitable for closed-loop recycling and can tolerate impurities.

# Titanium

- The opportunities for titanium are both in wrought alloys and in powders for additive manufacturing for the aerospace industry, both for structures in composite aircraft and for lightweight, fuel-efficient engines.
- If the price of titanium could be halved, this would generate at least a tenfold volume growth as seen with aluminium.
- With titanium, the buy-to fly cost is key and research must be done to provide near-net shape components. Currently, machining results in 75% losses
- There is a need to develop the UK titanium supply chain.

# Magnesium

- Magnesium has a new potential market in medical applications and magnesium diecastings are still growing strongly in automotive applications.
- However, the use of wrought products still remains hampered by enabling technologies (joining and corrosion control) and by cost.
- The positive amendment of flammability regulations by the FAA (Federal Aviation Authority) means that the use of both wrought and cast alloys for secondary aerospace applications (e.g. seats and trolleys) are likely to see resurgence.
- There is not a satisfactory recycling route for magnesium

# Concerns and Issues 1

- Collaboration and communication amongst the key players in light metals is an issue. There should be more collaboration between aluminium, magnesium and titanium to address issues that are common to all three, such as sustainability. Furthermore, there are synergies between the aerospace and automotive markets, such as lightweighting strategies, that are not being exploited.
- There needs to be regular communication between the IOM3 (LMD) Light Metals Division and TSB/EPSRC so that they have the right information to make decisions.

## Concerns and Issues 2

- There isn't a centre in the UK for recycling mixed Al alloys like there is for mixed polymers. This means they are sent overseas for sorting which results in a poor carbon footprint. The government policy on, for example, carbon credits does not help us to develop our own recycling industry. Is this something the TSB can influence?
- High temperature capability is required for use in aerospace engines. This is also something JLR have expressed an interest in automotive.
- There are not enough metallurgists and there is no metallurgy degree in the UK. As a result, the light metals expertise in the UK has degenerated and there's concern that this will affect future programmes: the metallic wing programme for example.
- Composite Leadership Forum – can this model be transferred to Light Metals?

# THANK YOU

To get involved, please contact:

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