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Evaluating Critical Raw Material Supply for Australia's Defence Sector

Stakeholder Engagement Workshop

When: 10am-4pm, 15th March 2019

Where: RMIT Melbourne City Campus

Jointly Hosted by: Monash University, University of Melbourne and RMIT University

PURPOSE OF THE WORKSHOP

This workshop will bring together expert stakeholders to begin a dialogue, identify perspectives, and develop an understanding of research needs related to the supply of critical raw materials to Australia's Defence Sector. Workshop participants will develop a shared understanding of the concept of resource criticality, how this may apply to the defence sector and supply chain participants, and the perspective of various stakeholder groups on related issues. The feedback provided by workshop participants will be essential in defining the nature and direction of future research efforts to evaluate critical raw material supply risks for Australia's defence sector.

Key topics addressed in the workshop include:

- Critical raw material risks and evaluation techniques
- International examples of material criticality assessments
- Perspectives on critical raw material risks in the Australian economy and defence sector
- Key perspectives & challenges from your organization or industry sector

We invite you and interested colleagues from your organisation to participate in this workshop, organised as part of project funded by the Defence Science Institute (DSI).

Please RSVP by Friday, 15th February.

For further information or to RSVP your attendance, please contact:

Dr Stephen Northey | stephen.northey@monash.edu | +61 488 011 132

or

Dr Zhehan Weng | zhehan.weng@rmit.edu | +61 435 118 588



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WORKSHOP FORMAT AND AGENDA

The workshop will be held over one-day, with presentations and discussions oriented towards investigating the interrelationships between critical raw material evaluation and the supply security for Australia's Defence Sector. Recommendations and key feedback from all participants will be the foundation for the methodological development of this research cluster. The number of participants is limited to 50 invited experts working on the above-mentioned themes.

9:30 – 10:00 – Meet and Greet

10:00 - 10:15 – Introduction

10:15 – 12:00 – Presentations – Material Criticality Theory and International Adoption

12:00 – 13:00 – Lunch

13:00 – 14:00 - Presentations – Defence Industry and Supply Chain Perspectives

14:00 – 15:45 – Roundtable Discussion & Feedback Collection

15:45 – 16:00 – Closing statements

BACKGROUND ON RAW MATERIAL CRITICALITY

'Criticality' assessments evaluate the exposure and vulnerability of an actor to potential raw material and mineral supply chain disruptions. Supply chain disruptions are caused by a variety of factors, including potential economic or geopolitical conflicts and may be exacerbated in situations of excessive import dependence from unstable or hostile countries. As a result, it has been speculated that future resource conflicts may not just be associated with fuel resources (e.g. oil, gas), but may also arise from competition and access to strategic, non-fuel minerals and elements (e.g. the rare earth elements) (www.pnas.org/cgi/doi/10.1073/pnas.1717152115). In the context of the United States, recent research has developed approaches for early-warning screening of mineral criticality in an attempt to pre-emptively avoid potential supply constraints (<https://doi.org/10.1007/s13563-017-0119-6>), and there has also been work undertaken by the U.S. Geological Survey to assess mineral criticality risks for the U.S. defence and manufacturing sectors (<https://doi.org/10.3133/ofr20181021>). However, to our knowledge there has been no equivalent assessment of mineral criticality risks for the Australian defence sector.

Criticality assessments may provide a unique perspective of the potential risks and threats associated with the supply and trade of minerals and raw materials. The manufacturing and industrial systems that underpin modern defence capabilities rely on materials and goods produced and imported from foreign countries and companies. As a result, there may be inherent, potentially unrecognised, vulnerabilities present in supply chains that may be impacted upon by economic and geopolitical conflict. This workshop forms part of a project that seeks to provide an analytical framework for evaluating raw material criticality from the perspective of the Australian defence sector.

FUNDING PARTNER

This workshop forms part of a project funded by the Defence Science Institute (DSI) entitled *Evaluating Critical Raw Material Supply for Australia's Defence Sector*.

DSI was established in 2010 within the University of Melbourne. DSI is funded jointly by the State Government of Victoria, the Commonwealth Government's Defence Science and Technology (DST) Group and the University Melbourne, with the aim of harnessing Victoria's universities to deliver integrated multi-disciplinary solutions for the defence sector.

<http://www.defencescienceinstitute.com/>



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ORGANISERS

Dr Zhehan Weng, Research Fellow, RMIT University (zhehan.weng@rmit.edu.au)

Dr Weng is an expert on the global distribution of mineral resources. His assessments cover a range of commodities that are considered critical to defence applications and advanced technologies, such as the rare earth elements and cobalt.

Dr Stephen Northey, Research Fellow, Monash University (stephen.northey@monash.edu)

Dr Northey is an expert on life cycle assessment methods and the intersection of material supply with broad-scale risks, such as climate change and water scarcity. He is working to develop long-term scenario models of raw material supply.

Assoc. Prof. Mohan Yellishetty, Associate Professor, Monash University (mohan.yellishetty@monash.edu)

Dr Yellishetty is an expert in sustainable mining and global material flow analysis of metal commodities. His research has extended from the iron ore and steel sector, through to specialty metals such as gallium, germanium and antimony.

Mr Ye 'Eric' Yuan, PhD Candidate, Monash University (ye.yuan@monash.edu)

Mr Yuan has developed methods for evaluating resource criticality using machine learning and AI approaches. He has used these to understand dynamic responses in critical commodity markets, such as for the platinum group elements.

Dr Stuart Walsh, Senior Lecturer, Resources Engineering, Monash University (stuart.walsh@monash.edu)

Dr Stuart Walsh is an applied mathematician, specializing in computational geoscience and engineering. His research interests include the economic assessment of large-scale energy and mineral resources projects.

Dr Mario Andrés Muñoz Acosta, Lecturer, Faculty of Engineering, University of Melbourne (munoz.m@unimelb.edu.au)

Dr Muñoz Acosta focuses on the application of computational intelligence, machine learning and data analytics methods to the analysis of highly interconnected, decentralized and adaptive systems.

Assoc. Prof. Gavin Mudd, Associate Professor, RMIT University (gavin.mudd@monash.edu)

Dr Mudd is a leading expert on sustainable development in the minerals industry, the global reserves and resources of critical minerals, and the long-term evolution of mineral and metal supply chains.