

Design for a circular economy - a company pathway to the challenge of critical raw materials

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Abstract relating to the presentation

Materials criticality is a highly complex challenge with economic, geopolitical, environmental and business impacts. Many products are currently designed and engineered in such a way that they cannot achieve their current performance without using critical materials.

For companies that are unaware and therefore unprepared, the current situation presents a considerable adverse risk. Most of the critical materials research that has been conducted has a focus in a number of domains such as materials science (substitution), economics, geopolitics, national security and recycling. The awareness and corresponding responses of product producing companies, across the whole supply chain, to materials criticality, is unclear. Results from TU Delft research with 30 companies in The Netherlands indicate that a small number see the phenomena of critical materials as an opportunity to develop a more sustainable competitive advantage via new product & service innovations.

This presentation focuses on the implications critical materials has for sustainable innovation, and proposes materials criticality thinking as a circular innovation driver. The presentation will have a focus on 'substitution' product designs that utilise new business models, are designed for longer life, disassembly, reuse and remanufacture. This approach will in turn support recycling. The presentation is a result of research supported by the FP7 project CRM_Innonet and the Schmidt MacArthur fellowship.