

**Strategic Materials for a Low-Carbon Future: From Scarcity to Availability**  
**2-3 November 2017 – Session Summary**

**Breakout 1c: Critical metals in high technologies: managing complexity**

Rare earth elements are raising concerns from public authorities as they are increasingly used in strategic sectors of the economy such as telecommunication and defence. What is the reality of rare earth elements availability now and in the foreseeable future? How are digital technologies driving a more complex resource landscape? Is the increasing role played by rare earth elements in high technologies a reasonable source of concern? How is complexity and diversity making products more vulnerable to risks in supply of those metals? And what is the true risk from geopolitical imbalances of supply and demand?

**Alex King**, Director, Critical Materials Institute, T U.S. Department of Energy

**David Peck**, Manager, KIC EIT EU Raw Materials Programme, Delft University of Technology (TU Delft) & Manager, Leiden-Delft-Erasmus Centre for Sustainability (CfS)

**Markus Reuter**, Director, Helmholtz Association

Moderator: Xianlai Zeng, Associate Professor of Environmental Science and Engineering, School of Environment, Tsinghua University

- Exact definitions of critical / strategic metals vary from government to government. Rare earth metals, essential for high-tech devices and other modern industrial applications, may not technically be rare, but are frequently produced only as a by-product of another metal. These factors leave them open to short-term supply risks: for example, in mobile phones there are 70 elements, which means 70 different supply chains in which there may be a short-term (1-2 year) shortage bottlenecks. For industries with a short business cycle, that means going out of business.
- Current technology has evolved towards ever more functionality and this has meant more materials for each functionality. Complexity doesn't have to mean more materials and the fewer you use, the easier a product is to recycle.
- Manufacturers need to be involved in the circular economy discourse as well. That discourse tends to omit the technologies and processes of 'making stuff'. Speakers agreed we need analytical tools to assess the recyclability of new products and devices, and to push for greater simplicity in making devices, in a way that allows their end of life to be managed. The role of the market in making critical minerals available was also debated.