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

Breakout 1e: Low-carbon technologies: resource scarcities, surpluses and uncertainties

Clean technologies such as solar panels, and onshore wind have won tremendous market share gains over fossil fuels in recent years. What does the upcoming deployment curve look like, and what is the implication for the resources required to support that deployment? How is fast technological deployment impacting uncertainty of future materials demand and what are the consequences of such uncertainty? Will regulatory intervention help or hinder?

Aled Jones, Director, Global Sustainability Institute, Anglia Ruskin University
Jaakko Kooroshy, Executive Director, Global Investment Research Division, Goldman Sachs
Olivier Vidal, CNRS-INSU Director of Research, Institut des Sciences de la Terre, University of Grenoble

Moderator: Chris Llewellyn Smith, Director, Energy Institute, University of Oxford

- Clean energy generation is distributed and often requires more land and material resources than fossil fuel energy generation. This can be illustrated by the varying intensity of steel use: 250 t/MW capacity for wind, vs 70 t/MW for coal, 60 t/MW for nuclear, and 40 t/MW for gas. One extreme scenario (Garcia-Olivares 2013) estimated that 100% renewable energy would require around 10x the global production of raw materials - for instance, copper demand in 2050 was projected to be 70 mt vs 15 mt of production in 2010.
- In the medium term, however, there are significant uncertainties about how fast the costs of new technologies will fall.
- Speakers agreed that we need to model the energy transition, in the context of aspects like the social impact of extraction and maximising the positive development aspects of clean energy. Aled Jones is part of the EU's MEDEAS project, which aims to develop an open-source model to guide the European low-carbon transition. The growing availability of granular data allows better prediction of markets.

An audience member raised the question: no-one is talking about 'less' (i.e. consuming less energy). Jaakko Kooroshy suggested that intelligent technology will be key to doing so: in one scenario modelled by the Goldman Sachs utilities team, if intelligent charging becomes deployable, no additional power generation capacity would be required by 2050.