Global shortage of materials an increasingly pressing issue

November 12 2013, by Roy Meijer

Between Monday 18 November and Wednesday 20 November, scientists and policymakers from across the world will come together at TU Delft to search for solutions to the global shortage of raw materials. The conference, 'Materials in a Resource Constrained World', organized by COST (European Cooperation in Science and Technology), will provide an excellent opportunity to develop a broad understanding of this increasingly pressing problem.

The earth's crust

Modern society has become utterly dependent upon affordable access to [raw materials](#). These are used to manufacture high-tech materials for applications in all kinds of areas: transport, electronics, the power supply, medicine and construction. But the combination of dwindling supplies, an expanding global population and sharply growing consumption in the developing world is putting the availability of materials under huge pressure. In theory, the earth's crust does indeed contain enough atoms of every element to satisfy global demand for a very long time, but in practice, there are substantial limits due to economic, geopolitical, social, technological and environmental factors.

A global issue

This is the issue being addressed by the COST conference on Materials in a Resource Constrained World. TU Delft researcher Dr Erik

Offerman is coordinating the event: 'We're bringing together policymakers and scientists from various disciplines to analyze the problem of global scarcity of materials and to explore potential solutions. The speakers come from every part of the world and are not only from universities and research institutions, but also from industry (including Siemens, Tata Steel, Rolls Royce, and Deutsche Telekom) and from institutes such as Clingendael and The Hague Centre for Strategic Studies (HCSS).'

Critical metals

Together, these speakers offer both a global and a geopolitical perspective on the materials problem. In addition to the technological perspective, this is of vital importance. Offerman points for example to the availability of critical metals. 'Substances such as neodymium, cobalt, indium, and niobium are crucial in our society. Niobium is used in high-strength, 'work-horse' steels. Indium forms part of the substance indium-tin-oxide, which is used in modern touchscreens. Critical metals will also play a key role in our sustainable power supplies in the future. Neodymium is a critical element in the strongest permanent magnets used in wind turbines. By using so-called nickel-based super alloys in power station components, we can make them run five per cent more efficiently. This gain alone would be much larger than what is currently produced from wind and solar energy put together. However, these super alloys contain the critical metal cobalt from Congo.'

Opportunities

'The supply of [rare earth metals](#) like neodymium is dominated by China, The platinum-group metals are predominantly mined in Russia. Niobium-mining is mainly performed by Brasil. 'China officially restricts the export of rare metals for environmental reasons, but there may also be

geopolitical reasons involved, meaning that their availability is not guaranteed and the prices fluctuate rapidly,' says Offerman. 'The search for new materials that are less dependent on these critical raw [materials](#), better recycling possibilities, sustainable mining, and design for the circular economy are thus a matter of real urgency for Western countries and it's also a great opportunity for our economy and our environment.

Provided by Delft University of Technology