



COST

COST Trans-disciplinary Science & Technology Strategic Event

Materials in a Resource-Constrained World

18-20 November 2013
Delft University of Technology,
Delft, The Netherlands



Modern society is totally dependent upon the **affordable access to raw materials** from which high-tech materials are produced for the automotive, aviation, electronics, power generation, medical, construction and other industries. We live in a materialized world. However, the triptych of decreasing finite natural resources, an ever increasing human population, and rapidly increasing levels of consumption in the developing world are putting increasing demands on the planets' raw materials and natural resources.

In theory, the earth crust contains enough atoms of every element in the periodic table to satisfy the world's need for materials for a very long period of time to come. However, in **practice the resources available for the production of materials are constrained** by economic, environmental, societal, geopolitical, and technological factors and by the linkages between the production of materials, energy, water, and food.

The question is **how can we continue to provide society with materials whilst living in a resource-constrained world?**

This event will bring together policymakers and scientists across different disciplines to:

- Analyse the problem of the increasing demands on the planets' raw materials and natural resources
- Explore potential solution strategies for affordable access to and production of materials in a resource-constrained world, including sustainable mining, recycling and substitution of critical materials, material life-time extension and product design
- Discuss ways forward for research, policy and practice.

Keywords

Raw Materials, Resource Efficiency, 'Non-Energy, Non-Agricultural Raw Materials', 'Sustainable Exploration, Extraction, Processing, Recycling and Substitution'

Website and Registration

All participants have to register via www.cost.eu/events/materials
Please note that the number of participants is limited to 110.

Scholarships

A limited number of scholarships is available for early stage researchers and academics to cover their travel, hotel, and registration costs. To apply for these scholarships please follow the 'Registration' link at www.cost.eu/events/materials. We offer non-reimbursed participants reduced hotel rates.



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Materials in a resource-constrained world - DRAFT Programme (3 October 2013)

Day 1 Monday 18 November 2013	
09:00 – 09:30	Registration and Coffee
09:30 – 10:00	Opening of the trans-disciplinary strategic event
	Dr Dirk-Jan van den Berg President of Delft University of Technology, NL <i>Welcome by Delft University</i>
	Dr Anthony Flambard COST DC Chair MPNS; Forschungszentrum Juelich, DE <i>Welcome by COST</i>
	Dr Erik Offerman Event Chair; Delft University of Technology, NL <i>Introduction</i>
10:00 – 11:00	Global dimensions of Materials, Part I
	Dr. Ester van der Voet United Nations - International Resource Panel <i>Challenges of anthropogenic metals cycles</i>
	Prof. Alex King Director, Critical Materials Institute, USA <i>Critical materials for clean energy technology</i>
	Prof. Koichi Tsuchiya Managing Director of Research Center for Strategic Materials, NIMS, JP <i>Japan perspective on Raw and High-tech materials</i>
11:00 – 11:30	Coffee & Tea break
11:30 – 12:10	Prof. Frans Spaepen Professor, Harvard University, USA <i>How will new materials be discovered? A historical perspective</i>
	Prof. Qing Liu Vice-President Chongqing University, PRC <i>China perspective on Raw and High-tech materials</i>
12:10 – 14:00	Lunch
14:00 – 15:20	Global dimensions of Materials, Part II
	Prof. Veena Sahajwalla Director SMaRT@UNSW, University New South Wales, AU <i>Sustainable Materials Research and Technology</i>
	Prof. Dr Ing. h.c.. mult Friedrich-Wilhelm Wellmer Former President, former President of the Federal German Geological Survey, DE
	Prof. Dr Michael Jischa Honorary-President, Club of Rome Germany Association, DE <i>Forty-years "Limits to growth"</i>
	Prof. Arnold Tukker Professor, Leiden University, NL <i>Role of industrial ecology</i>
15:20 – 16:00	Coffee & Tea break
16:00 – 17:20	Industry – Sibbe Hoekstra
	Dr Ute Liepold Project Manager, Siemens Corporate Technology, DE
	Dr Debashish Bhattacharjee Director of Research, Development & Technology, Tata Steel, IN
	Dr Cornelia Szyszkowitz Head of Information and Sustainability, Deutsche Telekom Technik GmbH, DE
	Dr Andrew Clifton Manager Sustainable Development, Rolls Royce, UK
17:20 – 18:15	Roundtable
19:00 – 22:00	Dinner





Day 2 | Tuesday 19 November 2013

08:30 – 09:00	Registration and Coffee	
09:00 – 10:20	Substitution	
	Dr Claire Claessen	Head of Projects, Chemistry Innovation Knowledge Transfer Network, UK <i>CRM_InnoNet: Mapping the substitution landscape</i>
	Prof. John Agren	Professor, Royal Institute of Technology, SE <i>Materials genome and integrated computational materials engineering</i>
	Prof. Helena van Swygenhoven-Moens	Professor, Ecole Polytechnique Fédérale de Lausanne, CH <i>Role of computational modelling in high-tech materials</i>
	Prof. David Jarvis	Professor, European Space Agency, EU <i>Novel productions methods for resource efficiency</i>
10:20 – 11:00	Designing out critical materials	
	Dr. James Goddin	Project manager, Granta Material Intelligence, UK <i>Material tools for product design</i>
	Dr. Leon Williams	Director Centre for Competitive Creative Design, Cranfield University, UK <i>Design-led strategic tools</i>
11:00 – 11:30	Coffee & Tea break	
11:30 – 12:10	Mining	
	Dr Volker Steinbach	Head of Department Energy and Mineral Resources, Federal Institute for Geosciences and Natural Resources, DE <i>Materials in a resource constrained world, German raw materials policy to meet industrial demand</i>
	Martijn Schouten	Managing Director, IHC Merwede, NL <i>Deep sea mining</i>
12:10 – 12:50	Recycling	
	Dr. Peter Tom Jones	University of Leuven, BE <i>Rare-earth element recycling</i>
	Dr. Yongxiang Yang	Delft University of Technology, NL
12:50 – 14:00	Lunch	
14:00 – 14:40	Materials in ICT	
	Prof. Sinn-wen Chen	Vice-President for Academic Affairs, National Tsing Hua University, TW <i>Electronic materials</i>
	Speaker TBC	
14:40 – 15:20	Materials for Energy technology	
	Prof. Oliver Gutfleisch	Professor, Technical University Darmstadt, DE <i>Materials for green energy technologies</i>
	Dr. Jasper Van Noyen	Sustainable Materials Manager, VITO NV, B <i>Material developments for CO2 capture</i>
15:20 – 16:10	Coffee & Tea break	





Day 2 | Tuesday 19 November 2013 (Continued)

16:10 – 17:10	Material life-time extension	
	Prof. Karl-Ulrich Kainer	Director Magnesium Innovation Centre (MagIC), Helmholtz-Zentrum Geesthacht, DE <i>Magnesium alloy development for the automotive and aviation industries</i>
	Dr. Päivi Kivikytö-Reponen	Scientist Advanced Materials, VTT Technical Research Centre of Finland <i>Increasing material efficiency by understanding and tailoring material performance in severe wear environments</i>
	Prof. Sybrand van der Zwaag	Director, TUDelft, NL <i>Self-healing Materials</i>
17:10 – 17:30	Elevator pitches posters Early Stage Researchers	
	Speaker TBC	
17:30 – 18:30	Poster presentations	

Day 3 | Wednesday 20 November 2013

08:30 – 09:00	Registration and Coffee	
09:00 – 11:00	Economics, Geopolitics, Environment	
	Dr Nikolaos Arvanitidis	Chair of the EuroGeoSurveys Mineral Resources Expert Group, GR
	Prof. Rob de Wijk	Director, The Hague Centre for Strategic Studies, NL <i>Geopolitical factors related to materials scarcity</i>
	Speaker TBC	
	Prof. Coby van der Linde	Director, Clingendael International Energy Program, NL <i>Polinares: Accessing minerals in a changing world</i>
	Speaker TBC	
11:00 – 11:30	Coffee & Tea break	
11:30 – 12:35	Continuation of the network in Horizon 2020 – Laurens Katgerman	
	Plenary discussion	All <i>Plenary discussion about the continuation of the network in Horizon 2020</i>
	Dr Erik S. Offerman	Associate Professor, Delft University of Technology, NL <i>Closure of the meeting</i>





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Steering Committee

Dr Derk Bol, Programme Manager, M2i - Materials innovation institute, The Netherlands

Laurens Katgerman, Delft University of Technology, The Netherlands

Michael Mente, Project Leader, BGR - Federal Institute for Geosciences and Natural Resources, Germany

Dr Erik S. Offerman, Delft University of Technology, The Netherlands

Dr Hans Schmiedel, RTM - Research in Telecommunication and Materials, Germany

Dr Caroline Whelan, Science Officer Materials, Physics and Nanosciences, COST – European Cooperation in Science and Technology

COST Domain Committee Chairs

Dr Anthony Flambard, DC Chair, Materials, Physics and Nanosciences (MPNS)

Prof. Soulla Louca, DC Chair, Information and Communication Technologies (ICT)

Prof. Dieter Schinzer, DC Chair, Chemistry and Molecular Sciences and Technologies (CMST)



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