

Materials Ecology

Session Chairs:

Carina Alles (DuPont)

Paul Collier (JM)

Frontiers of Engineering, Cambridge UK, 3rd September 2010



Session Concept

- **This session will attempt to answer the question, “What is materials ecology?”**
- **We will examine this concept as a synthesis of industrial ecology and materials life cycle management.**

How might we approach about this?

- **Natural biosystems exist in equilibrium with their surroundings**
- **Many human designed processes are far from this ideal**
- **Can we design new processes based on an ecosystem approach to take into account the whole life-cycle?**

What is materials ecology?

- **The old way of looking at manufacturing was a simple arrow from raw materials to products.**
- **Materials Ecology is a way of looking at materials that focuses on the interconnections within material flows.**
- **This avoids dead-ends and closed loops - as natural systems do.**

Materials Ecology: Overview

- 1. Industrial Ecology and Cradle-to-Cradle Management of Materials**

Sangwon Suh, UCSB

- 2. The Ecology of Energy Materials**

Klaus Hellgardt, Imperial College






- 3. Steel: A Sustainable Material**

Jean-Sebastien Thomas, AcelorMittal

- 4. Sustainable Life Cycle Management of Complex Products: Automobiles**

Wulf-Peter Schmidt, Ford

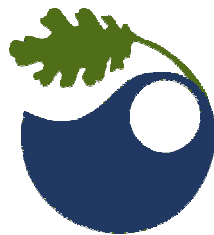
Materials Ecology: Schedule

- **Session Introduction** 8:30-8:35
- **Sangwon Suh** 8:35-9:00-9:05 
- **Klaus Hellgardt** 9:05-9:30-9:35 
- **Jean-Sebastien Thomas** 9:35-10:00-10:05 
- *Break - Return keys!* 10:05-10:35
- **Wulf-Peter Schmidt** 10:35-11:00-11:05 
- **Panel Discussion** 11:05-11:55 
- *Close session* 11:55-12:00
- *Lunch* 12:00

Sangwon Suh



- **Assistant Professor
Donald Bren School of
Environmental Science &
Management, University of California,
Santa Barbara**
- **Research interests include**
 - **How materials and energy are
extracted from the nature,
transformed and used, and**
 - **discarded back to the nature.**



Klaus Hellgardt



- **Senior Lecturer
Department of Chemical
Engineering and Chemical
Technology**
- **Research focuses on the
interface of reaction
engineering, chemistry and
materials science**

**Imperial College
London**



Jean-Sébastien Thomas



- **Leads Life Cycle Analysis team at ArcelorMittal**
- **Interested in steel as a sustainable material**
- **Previously at Veolia Environment, in charge of projects dealing with integrated water resource management**



Wulf-Peter Schmidt



- **Manager for Sustainability, Vehicle Environmental Engineering, Ford Cologne**
- **Interests are sustainable design and manufacturing, vehicle recycling, CO₂ and electric vehicles**



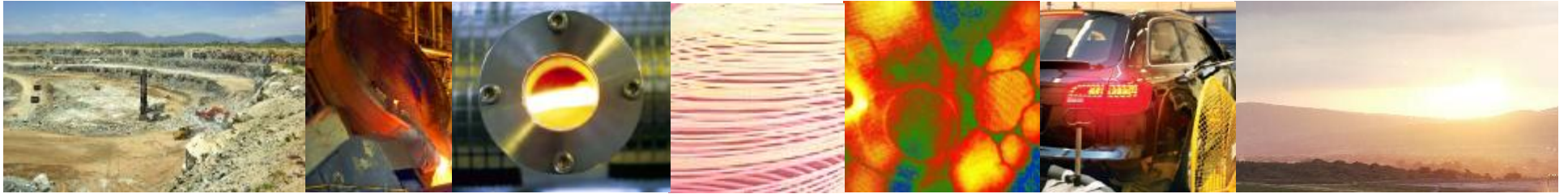
Panel session key questions

Why take up a materials ecology approach?

- **What is your biggest concern regarding the ways materials are currently produced, used and disposed of?**

How to apply a materials ecology approach?

- **What technologies enable the sustainable production, use and disposal of materials?**
- **Which obstacles need to be overcome?**
- **Where do we need technological innovations?**
- **Where do we need to think beyond technology?**



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