THE MATERIAL LIFE CYCLE
A STEERING WHEEL FOR EUROPE’S RAW MATERIALS ACADEMY

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Engineering Education in Europe
Going full circle?
Engineering Education in Europe

A cradle of engineering education

- First Mining Academies (1770)
  - 1763 Banska Stiavnica
  - 1765 Freiberg
  - ...

- Industrial Revolution (1850-1970)
  - Development of engineering education all along the value chain
  - Strong link with local industrial network
    - Leoben, Lulea, Liège, Nancy,...

RESOURCE MINING METALLURGY MECHANICS MANUFACTURING

Ir Géologue Ir Mines Ir Métallurgiste Ir Mécanicien
Engineering Education in Europe

Sustainable Choices?

- NIMBY engineering education
  - Industrial Evolution (1970-2010)
    - Moving to downstream activities
      - Aeronautics, ITC, Biotech,…
    - Disconnection with minerals, metals and materials
    - Mine and steel mill closures ➤ environmental concerns
      - Close down mining education or shift to geological engineering
  - Resilience
    - European Mining Course
      - Delft, Aachen, Helsinki, London
    - Tradition and/or strong socio-political awareness
      - Lulea, Freiberg, Leoben Wroclaw,…
There is a shortage of specialists in Europe in some of the areas related to raw materials production and processing (e.g. mineral processing), and the problem should be addressed at European level. The problems faced by the mining sectors are the lack of skilled workforce, no or sometimes bad image impacting interest in mining education and its relative unattractiveness, ageing workforce and lack of replacement." (EIP SIP Part II, p.46).
A time for innovation

EIT Raw Materials
A time for initiatives

Building a **Knowledge Innovation Community**

- EIT European Institute for Innovation and Technology
  - Enhance Europe’s ability to innovate by nurturing young entrepreneurial talent and supporting new ideas.
    - Set up a *unique* European Knowledge Innovation Community (KIC) with a *long-term* perspective and *top level* management
    - Promote education in the knowledge triangle

*From student to entrepreneur*
*From idea to product*
*From lab to customer*
A time for innovation

Building a **Knowledge Innovation Community**

- **EIT Raw Materials** *(est. Dec 2014)*
  - Boost the competitiveness, growth and attractiveness of the European raw materials sector via radical innovation and entrepreneurship.

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**Well-balanced consortium with 116 partners**

**Partners in 22 EU countries with special focus on ESEE**

**Full coverage of value chains and commodities (especially CRMs)**

**Business partners represent**
- >700,000 jobs
- >200 billion € turnover

**Partners’ roles in EIP RM commitments:**
- >75% participation
- 40% coordination
A time for initiatives

Building a Knowledge Innovation Community

- Developing a systemic thinking
  - The RM Academy aims at educating a new generation of European entrepreneurs to tackle the resource supply in a holistic and creative way.
A time for initiatives

Building a Knowledge Innovation Community

- Educating actors at the core of the raw materials value chain

Diagram:
- Resource efficiency in mineral and metallurgical **PROCESSES**
- **SUBSTITUTION** of critical and toxic materials in products and for optimised performance
- **MINING** in Challenging Environments
- **DESIGN** of products and services for the circular economy
- **EXPLORATION & Resource Assessment**
- **RECYCLING** and material chain optimisation for End-of-Life products

TMS 2016, Nashville
A time for initiatives

Building a Knowledge Innovation Community

- From T-shaped engineers to T-shaped entrepreneurs
  - A T-shaped professional combines an in depth knowledge of his own discipline with a sound understanding of the challenges of the raw materials value chain.
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Building a Knowledge Innovation Community

• Missions of the EU Raw Materials Academy

  o Promote a permanent offer of cross-disciplinary programmes.
  o Actively involve industry in education.
  o Promote problem-based learning, self organisation and learning by doing.
  o Offer an open learning environment and a series of online courses.
  o Facilitate access to experimental platforms for hands-on training.
  o Promote lifelong learning in the perspective of a resource efficient economy.
  o Stimulate wider society learning initiatives aiming at raising social awareness.
  o Foster international cooperation.
  o Create a lively community of alumni.
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Building a Knowledge Innovation Community

• Towards an EIT Labelling of Master / PhD programs
  
  o Robust entrepreneurship education
    • Entrepreneurial skills; Experience of professional life in industry;…
  
  o Highly integrated, innovative «learning-by-doing» curriculum
  
  o International and cross-organisational mobility
    • European dimension and openness to the world
    • English as teaching language
    • Multiple degrees
  
  o Access policy and joint outreach strategy
    • Joint admission criteria, joint diploma
A time for initiatives

• Master in Georesources Engineering (EMerald)
  o Innovative Education in Geometallurgy
    • Bridging the gap between resource experts and process engineers
  o Strong industrial support
    • Aurubis, Imerys, Lhoist, LKAB,…
  o Worldwide network of associates
  o Full English program

First steps

www.em-georesources.eu
A time for initiatives

First steps

- Towards EIT Labelling
  - EIT Raw Materials funded intensive “Winter Business School”
    - Marketing, Finance, …
    - Business Model + Business Game
    - Supply chain management
    - Young entrepreneurs testimonials

Working session with F. Renardy (CEO of G-TEC)

Working session with K. Whalen (Founder of “In The Loop”)

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Circular Economy

A steering wheel
Circular Economy

RM Academy’s ambition

• Become the steering wheel of a more circular economy
  o Connect all T-shaped entrepreneurs to actively contribute in steering tomorrow’s circular economy.