EIT RawMaterials

Successful practice of circular economy at EIT Raw Materials

Mo I Rana May 2017

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What is a EIT-KIC

KIC (**K**nowledge **I**nnovation **C**ommunity) is:

- A **thematic innovation community** that develop innovative products and services, foster new business, encourage growth and nurture young entrepreneurial talent
- Characterised by a **high degree of integration**, a long-term perspective, efficient governance, the co-location model and the **entrepreneurial culture**
- Unique partnerships that increase Europe's capacity for innovation by **bringing together leading companies, universities and research labs**
- Driven by a pursuit of **excellence**

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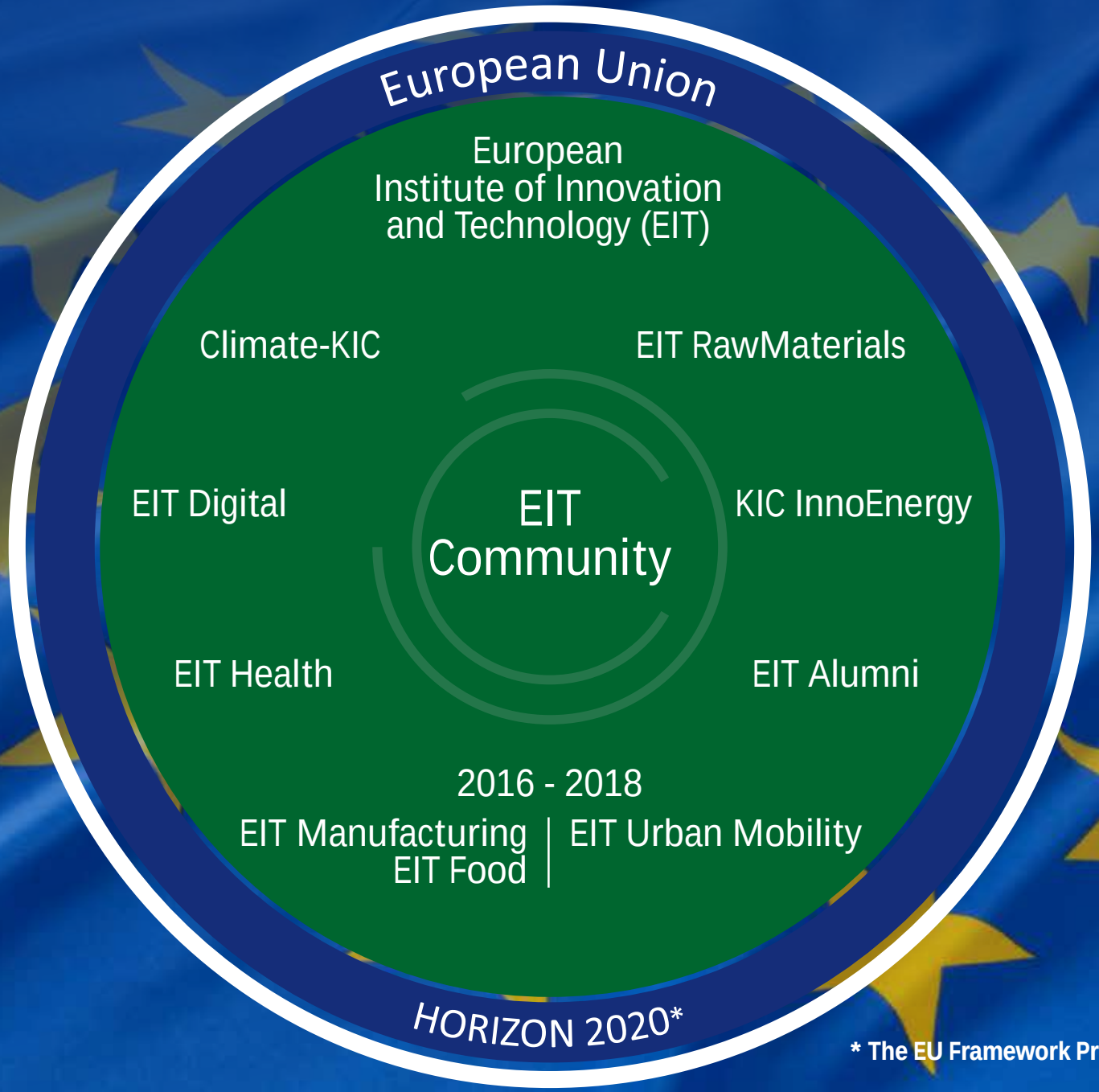

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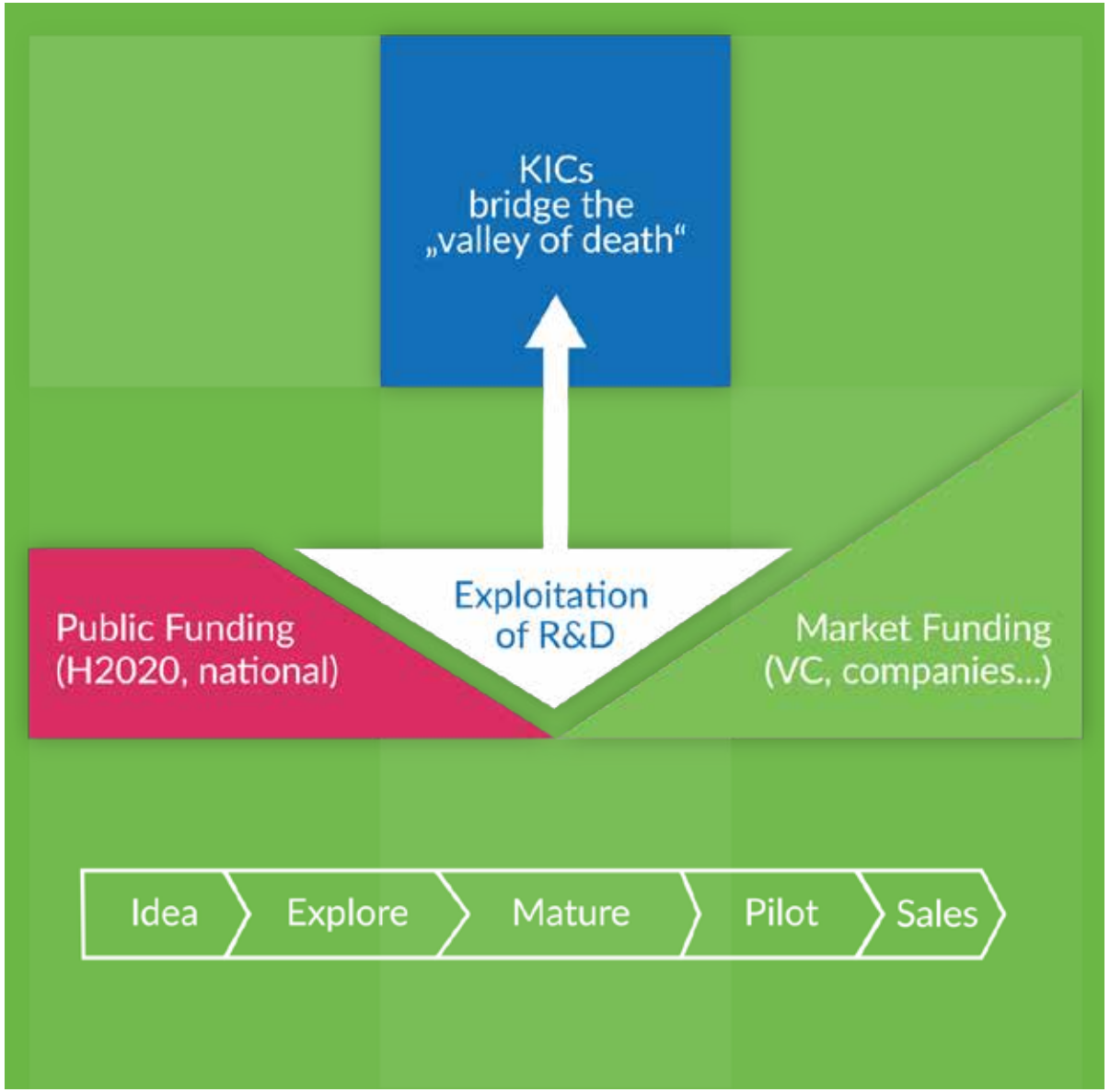
*** The EU Framework Program for Research and Innovation**

What is the purpose?

- Bridging the valley of death
- Market introduction of products and processes
- Educate entrepreneurs



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A pan-European network of Excellence

- Well-balanced consortium with ca. 120 partners
- Partners in 22 EU-countries with special focus on ESEE
- Full coverage of value chains and commodities (especially CRMs)
- Business partners represent more than 700k jobs, more than EUR 200 billion turnover
- Partners' roles in EIP RM commitments: more than 75 percent participation, 40 percent coordination

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Knowledge and Innovation Themes

- Exploration and raw materials resource assessment
- Mining in challenging environments
- Increased resource efficiency in mineral and metallurgical processes
- Recycling and materials chain optimisation for End-of-Life products
- Substitution of critical and toxic materials in products and for optimised performance
- Design of products and services for the circular economy

Circular Economy Definition

The concept is characterized, more than defined, as an economy that is restorative and regenerative by design and aims to keep products, components, and materials at their highest utility and value at all times

What about resource efficiency in producing those products, components materials???

Circular economy is a continuous positive development cycle that preserves and enhances natural capital, optimises resource yields, and minimises system risks by managing finite stocks and renewable flows. It works effectively at every scale.

Circular Economy Close the Loop/s

Different Complexity

- Simple products
- Complex products

Paper
Glass

Plastics

Metals

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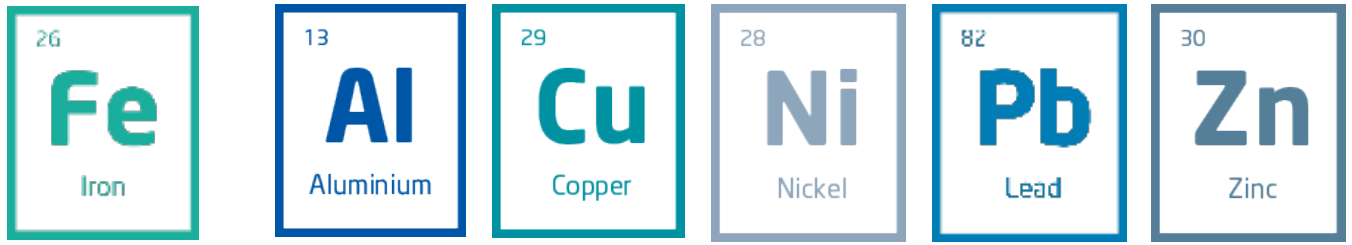
Circular Economy Close the Loop/s Metals example (Eurometaux info)

78% “recycling rate” = base metals



High volumes + High recycling rates

>95%
buildings

>90%
automotive

>60%
packaging

But what about the other 54 metals?

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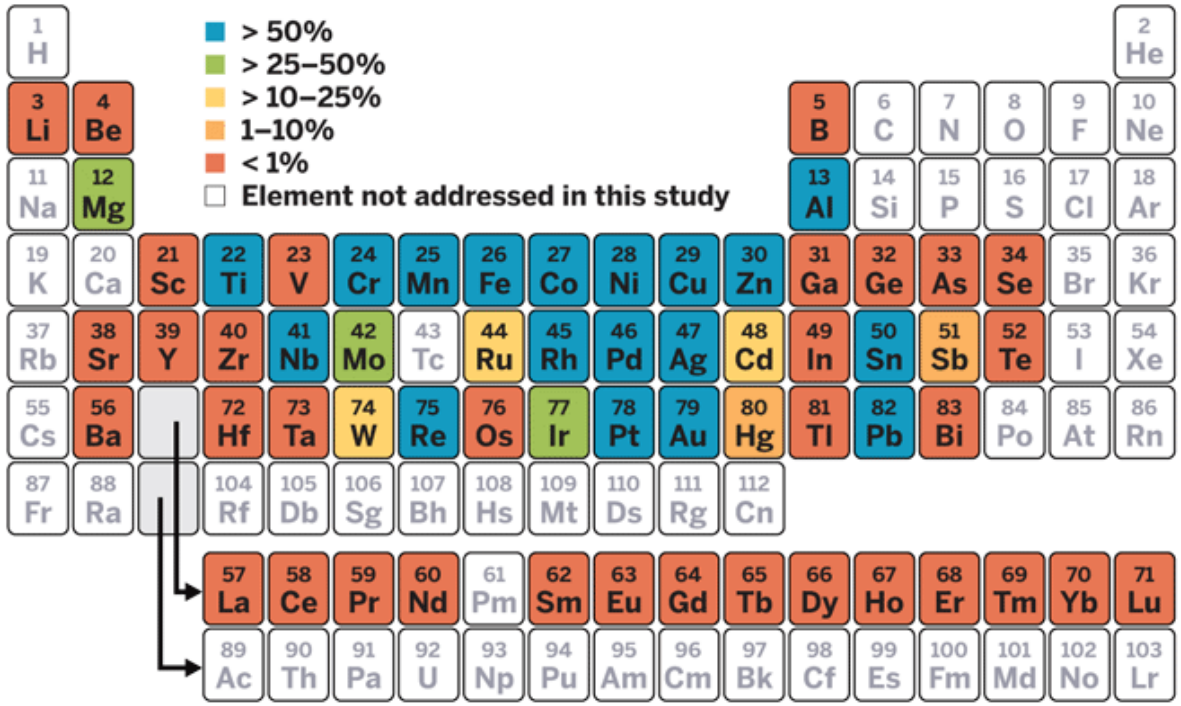
Circular Economy Close the Loop/s Metals example

UNEP Recycling Rates for Metals: We're still far away from circularity



"Global recycling rates show lots of room for improvement"

60 metals

>50% rate

18 metals

>1-50% rate

8 metals

<1% rate

34 metals

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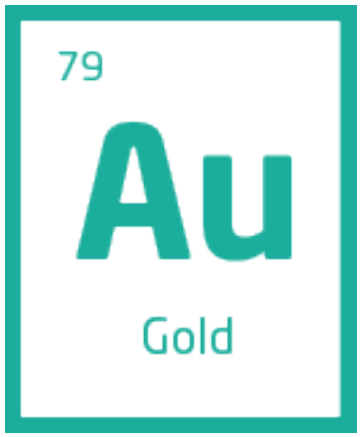
Circular Economy Close the Loop/s Metals example

Some circularity limitations are only evident on a product level



=

+

>50%

Jewellery

>90%

E-Waste

≈25%

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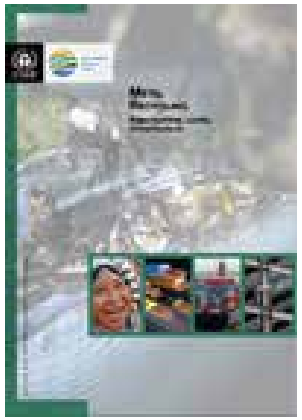
Circular Economy Close the Loop/s Metals example



UNEP Metals Recycling:

"Weight-based targets actually hinder recycling of critical elements in complex products"

e.g. Generic Smartphone (110g)

=

29 Cu Copper + 47 Ag Silver + 79 Au Gold + 46 Pd Palladium

10g <0.1g

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Circular Economy – EIT Rawmaterials

EIT Rawmaterials Themes

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Circular Economy

- **Design for Circularity**
- Collection
- Dismantling
- Recycling
- Resource Efficiency / Processing
- Waste prevention – New? business models (Reuse, remanufacturing,repair….)
- Sustainability Assessment/Circular Economy monitoring (reliable info??)

- Research, Innovation, Regulation, Policy, Market, Consumption Patterns,Entrepreneurship, business models…… **EDUCATION**

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EIT Raw Materials Activities

Matchmaking & Networking

1. **InfoCenter**
   Service desk / network / data base for providing knowledge of
   (a) Lab & test environment
   (b) Research & expertise
   (c) Idea& innovation
2. **Raw MatTERS Matches**
   Combining existing technology with new business models for licensing, joint ventures, access for students to find a job and a job to find a student, a platform for EU wide internships, SME needs for skills & expertise
3. **IDEA Camp**
   Event for idea exchange, starting event e.g. for SME Fast Track
4. **Intrapreneurship Facilitator**
   Event for generation & acce-leration of intrapreneurship

Validation & Acceleration

5. **Up-scaling**
   An innovation project that is at or near a TRL of demonstration or prototyping and needs a specific additional step to be taken

   These projects aim at
   (a) Integration of existing technology
   (b) De-siloing and value chain co-operation
   (c) Bringing technologies to the market
6. **Network of Infrastructure**
   Combining existing facilities to reach critical mass in the areas of
   (a) Pilot plants / technical centres
   (b) Analytical and modelling infrastructure

Learning & Outreach

7. **PhD Education**
   Raw MatTERS relevant courses / seminars / workshops
8. **Master Education**
   Modules for Masters Programmes focusing on Raw MatTERS Themes and industry needs
9. **Liefelong Education**
   Lifelong learning approaches address the industry's needs for qualified professionals
10. **Wider Society Learning**
    Aims to raise society's and decision makers' awareness through events and media coverage

Business Creation & Support

11. **Incubator& Business creation Services**
    Providing entrepreneurship services for supporting new start-ups (scouting, business model development, access to funding and technology, coaching, etc.)
12. **Start-up & innovation booster**
    Supporting entrepreneurs in creating their business
13. **SME Growth booster**
    Providing support for SMEs expansion abroad and tailor made benchmarking and matchmaking of local / regional actors
14. **Kick-start funding**
    Using own Raw MatTERS fund for pushing the best projects

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Examples: Up Scalling

SUPRIM. Sustainable Management of Primary Raw Materials through a better approach in Life Cycle Sustainability Assessment

Providing a service which can assist in the transition towards a more sustainable management of primary raw material extraction, it will enable a more objective and sustainable image for the primary raw materials sector in Europe

Collaboration of the three sides of the Knowledge triangle

- Universities: Ghent, Leiden, Lulea
- Research: Tecnalia
- Industry: Boliden,Cobre las Cruces

Examples: Up Scalling

DISPLAY. Upscale of material recovery from display applications and Printed Circuit Boards

The objective of the project is to upscale and implement an innovative process cas-cade specified to recover raw materials from electronic display appliances and printed circuit boards (PCBs). These items are highly integrated composites of polymers (25-40 %), glass (10-40%) and metals, including critical materials like indium, gallium, germanium, etc, bringing this process to TRL 7. The DISPLAY project intends to supply a technical solution for a material oriented disassembly of display appliances and PCBs by combining electrohydraulic fragmentation, spectroscopic sorting and the solvent based CreaSolv® process.

Fraunhofer, ENEA, CEA and SUEZ

Examples: Up Scalling

RED_SCOPE. Recovery of Effluent Discharge for Sustainable Copper Processing in Europe

The goal of RED_SCOPE is to enable the treatment of complex copper concentrates, which is aligned to the knowledge & innovation theme of increased resource efficiency in mineral and metallurgical processes. This means the demonstration of a flexible economic treatment of complex materials, thereby addressing the issue of removing the increasing amount of impurities and enabling greater reuse of process residues (recycling treated waste water).

Atlantic Cooper, IVL, SUEZ, Aquatec and Cetaqua

Examples: NoIs

PreFlex. Pre-treatment and physical separation of complex low grade ores and residues

EMFIS. European Material Stock and Flow Intelligence Service

ERMAT. Efficient use of Residual Materials

SSIC. Sustainability Support and Information Centre

STORM. Industrial Symbiosis for the Sustainable Management of Raw Materials

Examples: Education

GAMES. Great Adventures with Materials: Education for a Recycling Society (WSL)

Awareness of young people regarding Recycling

aRAWness. Enhancing European Society Awareness of Raw Materials (WSL)

Regional workshops for decision makers such as local and regional political actors to raise the European society awareness of the circular economy and to provide a better transparency for European citizens in the raw materials field

Examples: Internationalisation

intCEB. International Intelligence and Business Development Network on Circular Economy
Business Opportunities with China

Main aim to create an EU-China communication platform that can further enhance the collaboration on circular economy initiatives with better understanding on circular economy business models. The whole network is expected to share knowledge and create business opportunities bilaterally so as to help circular economy practitioners to promote the optimal resource efficiency options

EIT RawMaterials Activities 2016-2017

Area: KAVA Activity
(Annex reference)

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Thank you!

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