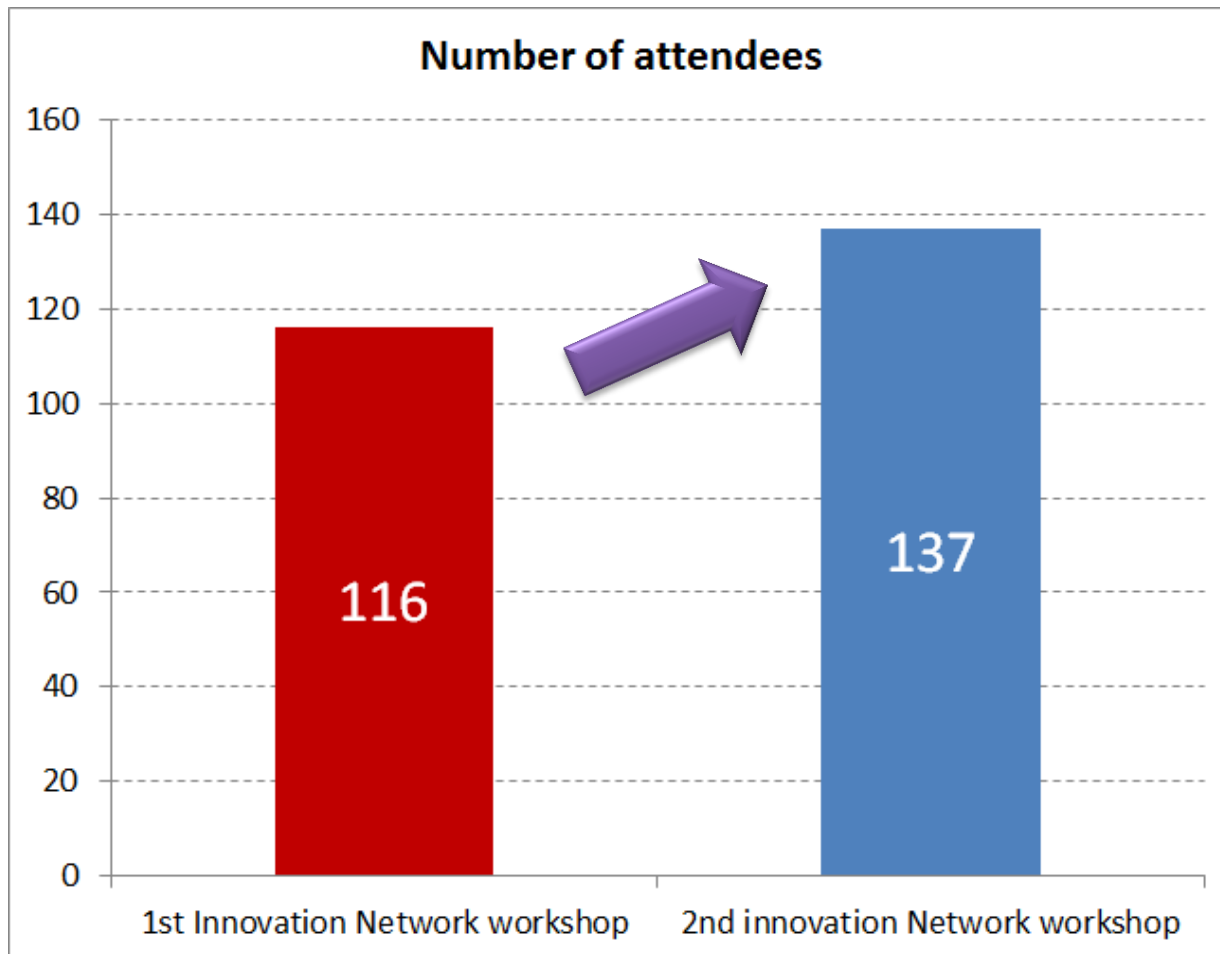


Critical Raw Materials Innovation Network

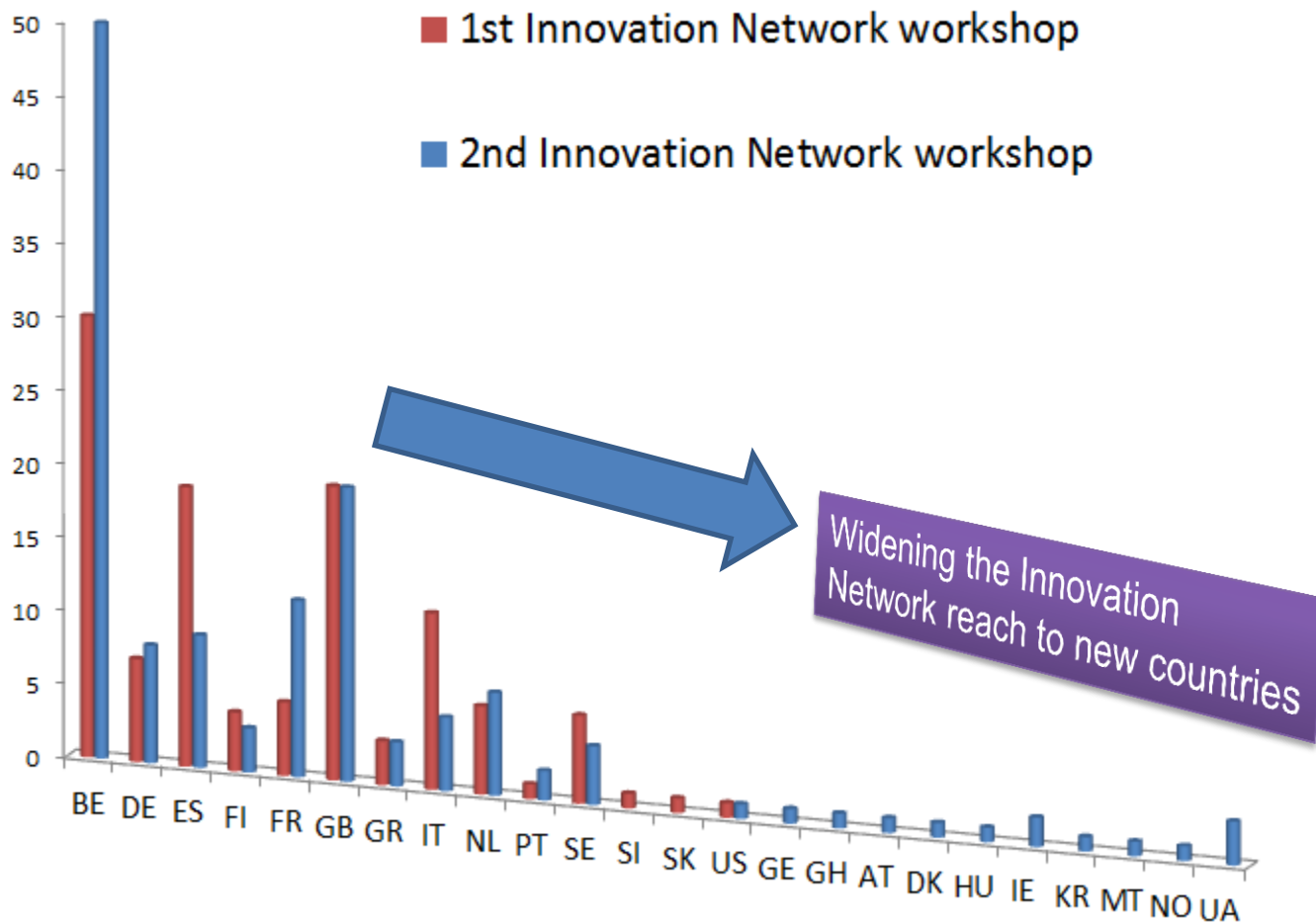
May 2014, Dr Claire Claessen



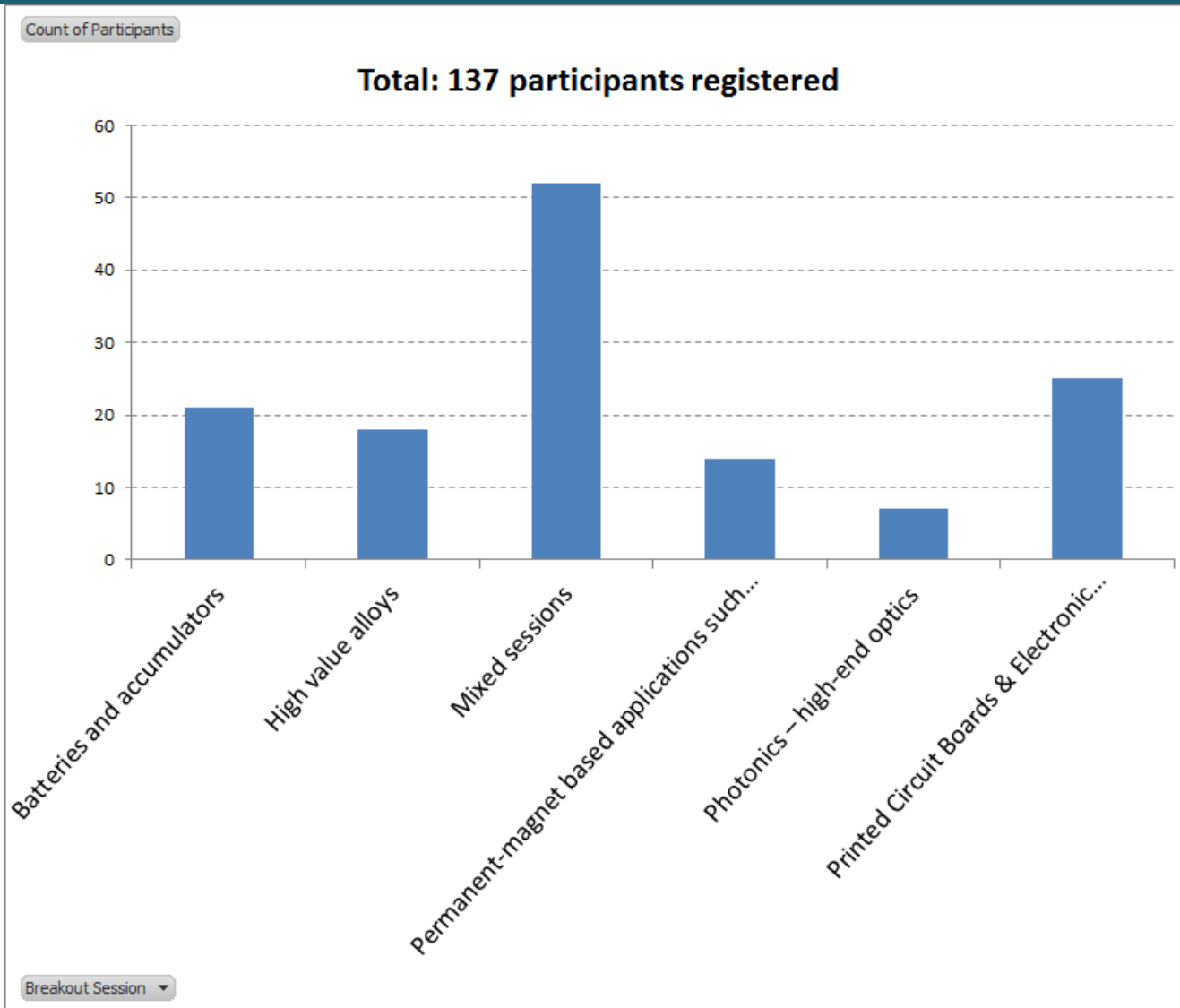


Growing community:

- 1st Workshop: 116 participants from 87 organizations
- 2nd Workshop: 137 participants from 110 organizations



From 14 to 22 countries



Participant's interests covering all prioritized applications

EU projects related to substitution of critical raw materials - Exhibition Session



Substitution of critical metals in industrial catalysts



Synchronous reluctance machine (SYRM) with potential to replace permanent magnet (PM) synchronous machines



NEXTGENCAT

Development of NEXT GENERATION cost efficient automotive CATalysts

Project N°: 280890

Novel eco-friendly nano-structured automotive catalysts partially or completely replacing PGMs.



Permanent magnets without rare-earths



Heusler Alloy Replacement of Iridium

Antiferromagnetic alloy that does not contain the rare metal Iridium.



Novel electric drive system for EVs free of rare-earth magnets

CRM_InnoNet

- Critical Raw Materials Innovation Network – Towards an **integrated community** driving innovation in the field of critical raw material **substitution** for the **benefit of EU industry**.

Consortium



A large, diverse crowd of people is shown at an outdoor event. The crowd is dense, with many individuals wearing sunglasses and casual summer attire. A semi-transparent text box is overlaid on the image, containing the text:

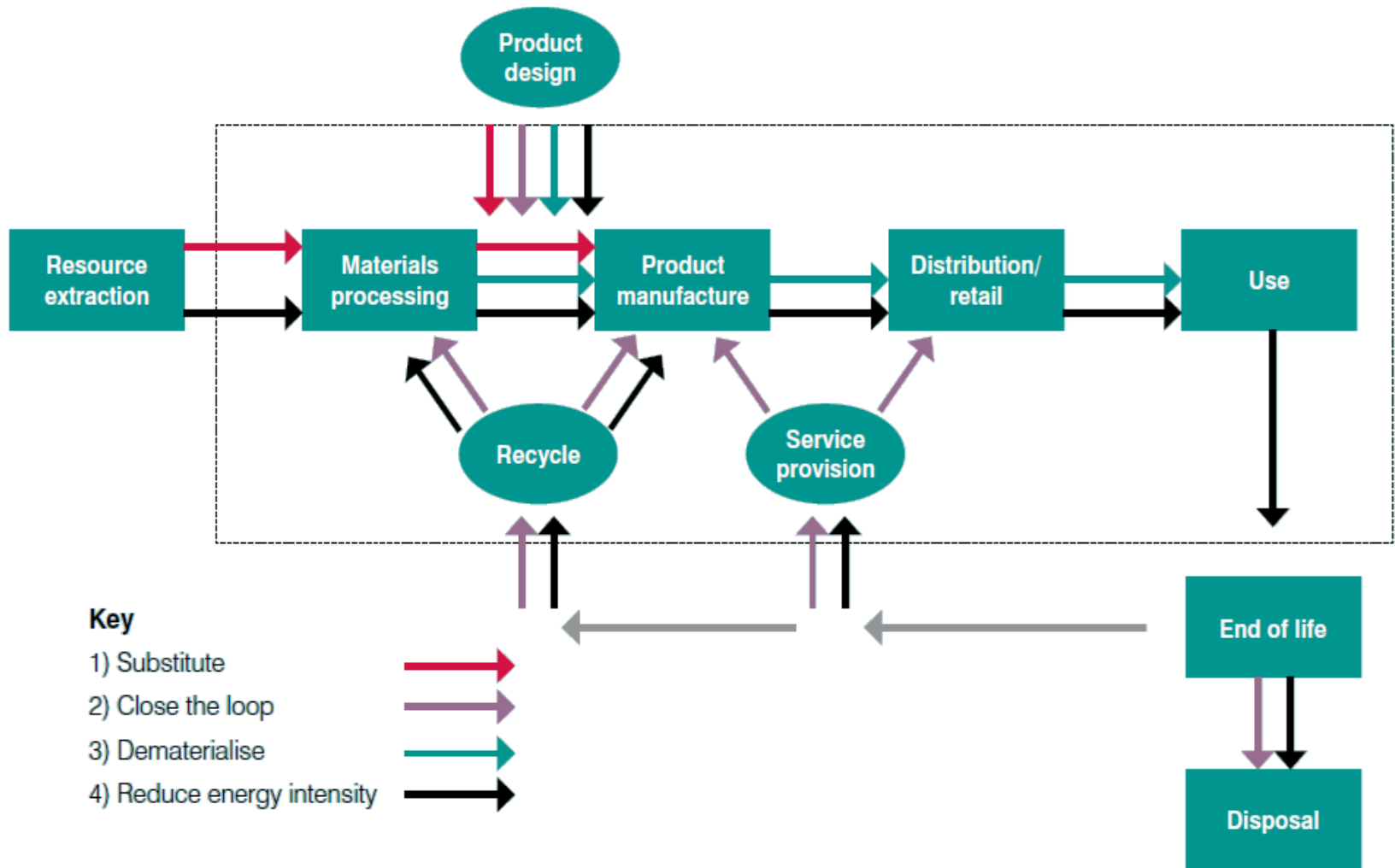
9.5 billion people expected to live on the planet by 2050

3 billion more middle-class consumers forecast in the global economy by 2030

Drivers

- Limited amount on the planet
- Being used in dispersive technologies
- Rapid growth in use due to technology application
- Method of obtaining is disproportionately damaging to environment
- Availability a geopolitical issue (political instability)
- Lack of recycling – technical and/or infrastructure

Approaches

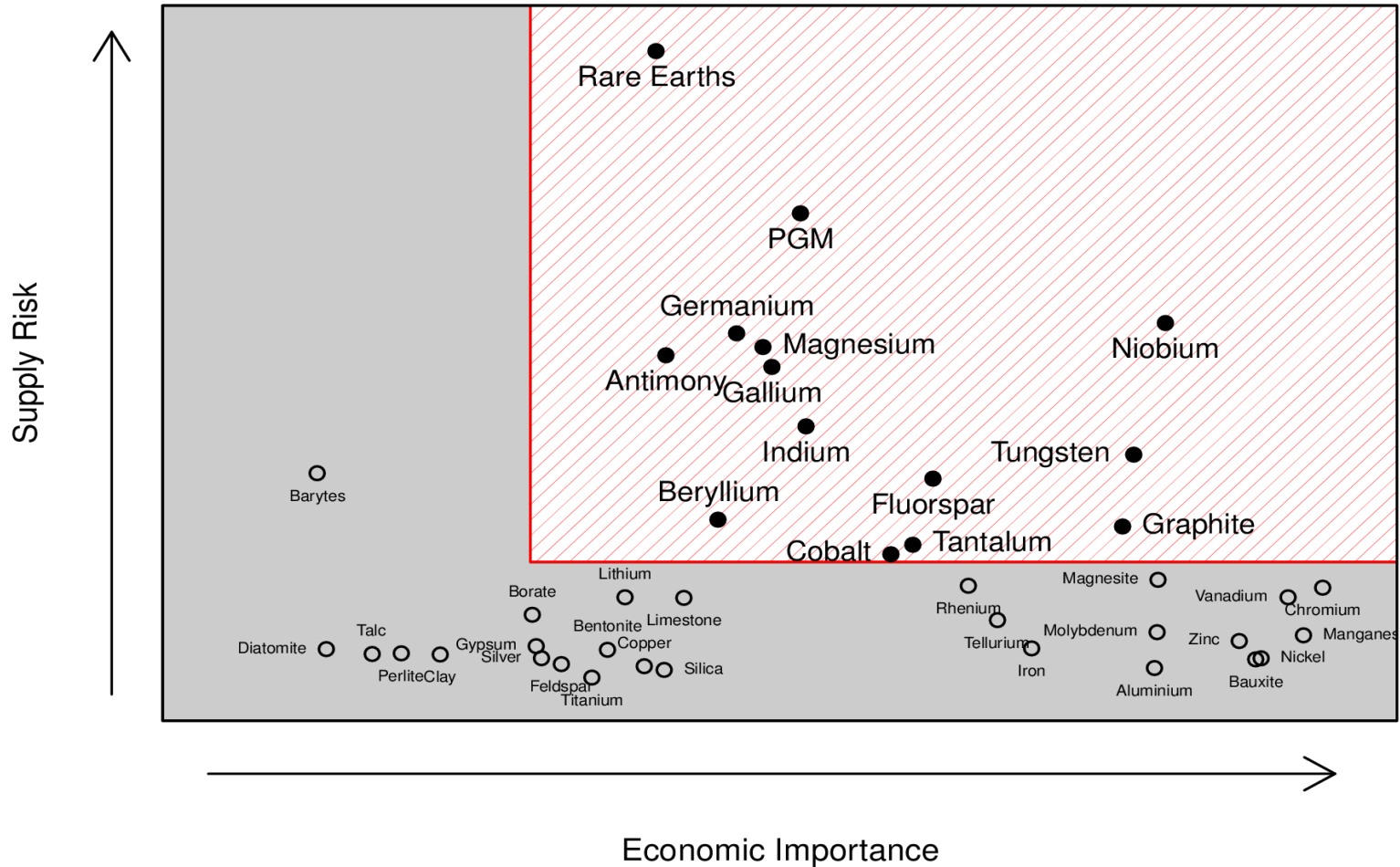




80% of senior executives from global manufacturing companies cite mineral and metals scarcity as a pressing issue (*PWC, Dec 2011*)

67% see this evolving into an area of opportunity, including the possibility of adopting alternative approaches or substitutes (*PWC, Dec 2011*)

EU Critical Raw Materials



Substitution:



Substance for Substance



Service for Product



Process for Process



New Technology for Substance

Mapping
current substitution
technologies and initiatives



Policy
recommendations



Prioritisation
of applications under threat



Networking
of the substitution
stakeholder community



Roadmap
for critical raw materials substitution



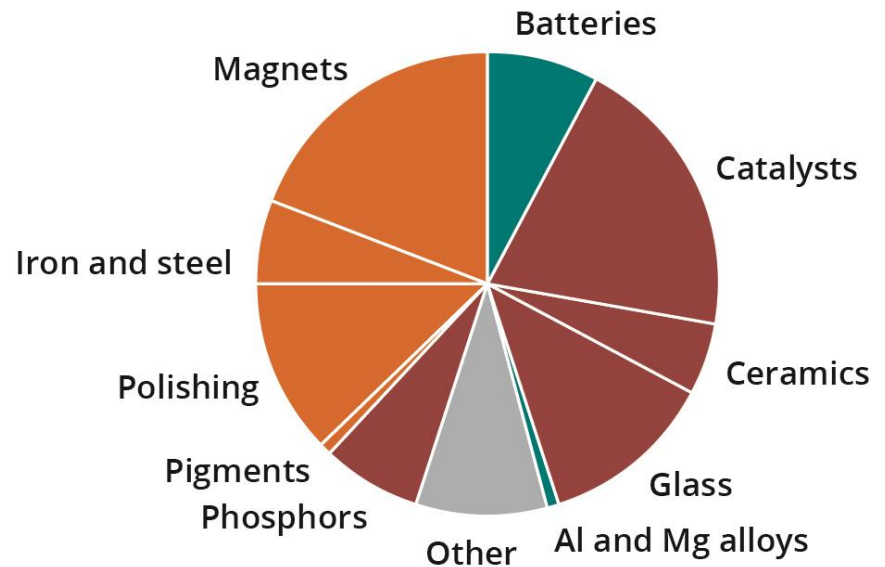
Material-led approach

Mapping
current substitution initiatives



- What are the raw materials used for?
- Are there alternative materials or technologies?
- What are their relative merits?

RARE EARTH ELEMENTS



Application-led approach

Mapping
current substitution initiatives



- Energy
- ICT and Electronics
- Transport (Automotive and Aero)

Prioritisation

of applications under threat



| Criterion | Sub-criteria |
|----------------------------|---|
| Economic | Global market share |
| | Jobs involved in the EU (excluding indirect jobs) |
| Availability | Amount of CRMs involved |
| | Expected future market development |
| | CRM function |
| | Availability and status of substitutes |
| Strategic Relevance | Associated to specific EU policies |



- Substitution strategies for CRM in priority sectors and applications
- To 2030 (by exception to 2050)
- Technical and Non-technical barriers

Policy recommendations



- Current Policies
- International learnings
- Success criteria for substitution
- Vision
- Political requirements

Adding Value

Networking
of the substitution
stakeholder community



- Expertise exchange
- Brokering new relationships
- Networking networks
- Central resource:
 - www.criticalrawmaterials.eu
 - News and events
 - Documents library
 - Quarterly project newsletter

Mapping
current substitution
technologies and initiatives



Value chain mapping:
Energy
Transport
ICT and Energy

Sept
2013

May
2014

 **CRM_InnoNet**
Substitution of Critical Raw Materials

Jan
2015

April
2015

Oct 2014

Mapping

current substitution
technologies and initiatives



Value chain mapping:
Energy
Transport
ICT and Energy

Sept
2013

Nov
2013

May
2014

Jan
2015

April
2015

**Raw Materials
Information
and Brokerage
event**

Networking

of the substitution
stakeholder community



SEVENTH FRAMEWORK
PROGRAMME



CRM_InnoNet
Substitution of Critical Raw Materials

Mapping

current substitution technologies and initiatives



Value chain mapping:
Energy
Transport
ICT and Energy

Roadmap

for critical raw materials substitution



Roadmap
Workshops

Sept
2013

Nov
2013

May
2014

Jan
2015

April
2015

Raw Materials
Information
and Brokerage
event

Networking
of the substitution
stakeholder community



2nd Innovation
Network
Workshop

Networking
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Value chain mapping:
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Policy
Workshops

Policy
recommendations



SEVENTH FRAMEWORK
PROGRAMME



CRM_InnoNet
Substitution of Critical Raw Materials

Mapping
current substitution
technologies and initiatives



**Value chain mapping:
Energy
Transport
ICT and Energy**

**Sept
2013**

Roadmap
for critical raw materials substitution



**Roadmap
Workshops**

**May
2014**

Networking
of the substitution
stakeholder community



**3rd Innovation
Network Workshop
& Project
Conference**

**April
2015**

**Raw Materials
Information
and Brokerage
event**

Networking
of the substitution
stakeholder community



**2nd Innovation
Network
Workshop**

Networking
of the substitution
stakeholder community



**Policy
Workshops**

**Policy
recommendations**



Project Website



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[Project Summary](#) [Innovation Network](#) [News & Events](#) [Project Objectives](#) [Documents](#) [Partners](#)

Related initiatives

First project workshop date announced!

Register today to attend a workshop to launch the project stakeholder network on Monday 15th April 2013 in Brussels.

[Read more](#)



Follow Us



CRM_InnoNet (Critical Raw Materials Innovation Network) will drive innovation and influence policy in the field of **substitution** of critical raw materials for the benefit of EU industry.

CRM_InnoNet is supported under the NMP (nanosciences, nanotechnologies, materials and new production technologies) theme of the European Commission 7th Framework Programme.

[News & Events](#)



[Innovation Network Workshop](#)
Mar 19, 2013, *Comments are off*

[Blog](#)

[Ongoing CRM_InnoNet research from TU Delft in the Netherlands](#)
Mar 04, 2013, *0 Comment*

[From Twitter](#)

RT @Dr_Catj: Transport, Aerospace, ICT or Energy company? Worried about materials security? Innovation Network for CRM can help

www.criticalrawmaterials.eu

Material-Led:
Luis Tercero
(Fraunhofer ISI)



Mapping
current substitution
technologies and initiatives



Ulla-Maija Mroueh (VTT),
Aymeric Brunot (CEA) and Lena
Smuk (SP)

Policy
recommendations



Prioritisation
of applications under threat



Andrea Ferrari
(D'Appolonia)

Networking
of the substitution
stakeholder community



Roadmap
for critical raw materials substitution



Daniela Velte (Tecnalia)

