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***Dr. Corina Hebestreit:
From Natural Resources to
Circular Economy***

**Industrial stakeholder workshop on an
enhanced LCA methodology**



This activity has received funding from the European Institute of Innovation and Technology (EIT), a body of the European Union, under the Horizon 2020, the EU Framework Programme for Research and Innovation

From Natural Resources to Circular Economy

The EU economic outlook as available/predictable today... forecasts an increase in raw material needs for whichever scenario of a future society we choose!

Despite higher resource efficiency in production and use and higher circularity of value chains efforts in the predictable future will be offset by

- growth and partially aging of world population,
- aspired improved standard of living,
- higher environmental and climate protection requirements.



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Vision: Raw materials in the 2050 society

- The acceleration in digitalisation, evolution of consumer behaviour, such as increased connectivity, the sharing economy, mass-customisation and sustainability, are reshaping the future of both products and processes.
- To achieve a global leadership in technological innovation, the industry in Europe is developing and improving smart technologies and applications that respond to consumer demands and global challenges that include the United Nations Sustainable Development Goals (SDGs) and the Paris Agreement on climate change.
- Innovation in raw material value chains help the EU achieve the targets outlined by its roadmaps for a resource-efficient Europe and a competitive low-carbon economy by 2050 .
- In response to these future drivers, the EU raw materials sectors need to foster a sustainable supply and use of raw materials to feed existing and new value chains through research and innovation. At the same time, it needs to ensure base loads from EU resources, decreasing import dependencies and resilience of the EU industrial base through resource diversification.



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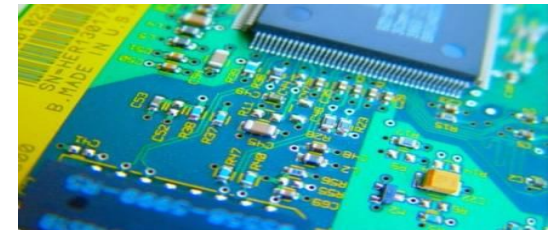
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The metals and minerals value chain

- The European mineral raw material sector is facing critical challenges in terms of supporting the transition to a low-carbon, gradually fossil-free sustainable Europe and the green economy.
- The metals mined are critical to build electric infrastructure as well as energy storage systems, renewable energy power plants and vehicles for both personal and commercial use.
- The sustainable supply of metals and minerals will also be critical to build a future sustainable society that will rely heavily on new transport infrastructure as well as new green buildings.
- The mining sector and the mineral processing sector are vital to securing the supply of metals extracted in a sustainable manner. The value chain spans from geological exploration, mining and processing to the recycling of metals. The aggregate sector is spread throughout Europe providing aggregates for the building and infrastructure industries. Embedded in the value chain is a strong environmental commitment both during operation, as well as for the reclamation of land used for mining..



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Policy instruments and legislation of relevance since 1998 on raw materials

- EU Communication on Safe Operation of Mines (COM (2000) 664)
- Communication from the Commission promoting sustainable development in the EU non-energy extractive industry
- Directive of the European Parliament and of the Council of 15 March 2006 on the management of waste from extractive industries (2006/21/EC)

- EU Raw Materials Initiative (2008)
- Critical Raw Materials
- EIT Raw Materials
- Trade agreements

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Policy instruments and legislation of relevance since 2000

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Waste – **waste** and more **waste**....

- EU Directive on Packaging and Packaging Waste (85/339/EEC)
- EU Directive on End-of-Life Vehicles (2000/53/EC) - calculation of recyclability and recoverability (ISO 22628)
- The European Integrated Product Policy (IPP) concept and the rising interest in live cycle related topics) (2003)
- Directive on Energy using products (EuP)) - Eco-Design Directive (2005/32/EC)
- EU Directive on Construction and Demolition Waste (2008/98/EC)
- Environmental Product Declarations (EPDs) are strong drivers for the use of LCS and related tools in the industry
- EU Directive in WEE (2012/19/EU)
- Green public procurement programmes
- Environmental Technologies Action plan (ETAP)
- Eco-Management and Audit Scheme



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Thematic Strategy on the Sustainable Use of Natural Resources

- "Towards a Thematic Strategy on the Sustainable Use of Natural Resources": Communication COM(2003)572
- On 21st December 2005 the European Commission proposed a Strategy on the Sustainable Use of Natural Resources used in Europe. The objective of the strategy was to reduce the environmental impacts associated with resource use and to do so in a growing economy. Focusing on the environmental impacts of resource use will be a decisive factor in helping the EU achieve sustainable development.
- It was estimated that 7 - 18% of all non-energy material consumption is saved or avoided due to current recycling, waste prevention and eco-design policies and practices. Recycling has by far the largest contribution (accounts for over 75% of total contributions) compared to waste prevention and product design. Waste prevention measures have considerable potential to reduce waste and overall material consumption. In both cases product design is the key to achieve greater amounts of recycling and waste prevention.
- The future feasible potential for material savings from recycling, waste prevention and eco-design are estimated to be from 15% to 28% of all non-energy material consumption. As material consumption is measured in weight, construction materials represent the greatest share of materials saved (about two thirds of the total materials saved). The recycling of metals, however, plays an important role in material productivity as this represents both significant environmental impact reductions as well as cost benefits. It was also shown that in general, increasing material productivity can also significantly reduce greenhouse gas emissions (3 - 5% of total annual GHG emissions).



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New Legislative Proposals contained in COM(2011)571 - Roadmap to a Resource Efficient Europe

By 2020, EU policies will take into account impacts on land use globally.

The Commission will define, together with stakeholders, robust, easily understandable and widely accepted indicators and targets by 2013
EU Resource Efficiency Transition Platform 2012

- Environmental Footprint for Eco-Design (2012)
- Sustainable Use of Phosphorous (2012)
- Green Infrastructure (2012)
- Resource-Efficiency Indicators (2013)
- Communication on Land Use (2014)
- "No Net Loss" initiative (2015)



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Closing the loop - An EU action plan for the Circular Economy (COM/2015/0614 final)

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- Product design
- The Commission will promote the reparability, upgradability, durability, and recyclability of products by developing product requirements relevant to the circular economy in its future work under the Ecodesign Directive, as appropriate and taking into account the specificities of different product groups. The Ecodesign working plan for 2015-2017 will elaborate on how this will be implemented. The Commission will shortly also propose Ecodesign requirements for electronic displays.
- The revised legislative proposals on waste creates economic incentives for better product design through provisions on extended producer responsibility.
- The Commission will examine options and actions for a more coherent policy framework of the different strands of work of its product policy in their contribution to the circular economy.



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Closing the loop – 2 -

- Production processes
 - The Commission will include guidance on best waste management and resource efficiency practices in industrial sectors in Best Available Techniques reference documents (BREFs) and will issue guidance and promote best practices on mining waste.
 - The Commission is proposing (in the revised legislative proposals on waste) to clarify rules on by-products to facilitate industrial symbiosis and help create a level-playing field across the EU.

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Closing the loop – 3 -

• Consumption

- The Commission will specifically consider proportionate requirements on durability and the availability of repair information and spare parts in its work on Ecodesign, as well as durability information in future Energy Labelling measures.
- In the revised waste proposals, the Commission proposes new rules which will encourage reuse activities.
- The Commission will work towards better enforcement of the guarantees on tangible products, examine possible options for improvement, and tackle false green claims
- The Commission will prepare an independent testing programme under Horizon 2020 to help the identification of issues related to possible planned obsolescence. This work would involve relevant stakeholders as appropriate.
- The Commission will take action on Green Public Procurement (GPP), by emphasising circular economy aspects in new or revised criteria, supporting higher uptake of GPP, and leading by example in its own procurement and in EU funding.

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Closing the loop - 4 -

- From waste to resources: boosting the market for secondary raw materials and water reuse
- The Commission will launch work to develop quality standards for secondary raw materials where they are needed (in particular for plastics), and is proposing improvements to the rules on 'end-of-waste'.
- The Commission will propose a revised EU regulation on fertilisers, so as to facilitate recognition of organic and waste-based fertilisers in the single market and thus support the role of bio-nutrients in the circular economy.
- The Commission will take a series of actions to facilitate water reuse; this will include a legislative proposal on minimum requirements for reused water, e.g. for irrigation and groundwater recharge.
- The Commission will develop analysis and propose options on the interface between chemicals, products and waste legislation, including on how to reduce the presence and improve the tracking of chemicals of concern in products.
- The Commission will further develop the recently launched Raw Materials Information System and support EU-wide research on raw materials flows.

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Closing the loop - 5 -

- Priority areas
- Plastics ...; Food Waste ... and
- **Critical raw materials**
 - The Commission will take a series of actions to encourage recovery of critical raw materials, and prepare a report including best practices and options for further action.
 - The Commission is also encouraging action by Member States on this topic in its revised proposals on waste.
- **Construction and demolition**
 - The Commission will take a series of actions to ensure recovery of valuable resources and adequate waste management in the construction and demolition sector, and to facilitate assessment of the environmental performance of buildings.



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Closing the loop – 6 -

• Waste management

The Commission is adopting, together with this action plan, revised legislative proposals on waste comprising in particular:

- long-term recycling targets for municipal waste and packaging waste, and to reduce landfill
- provisions to promote greater use of economic instruments
- general requirements for extended producer responsibility schemes
- simplification and harmonisation of definitions and calculation methods
- and will step up its work with Member States to improve waste management on the ground, including to avoid overcapacities in residual waste treatment.

The Commission will assist Member States and regions to ensure that Cohesion Policy investments in the waste sector contribute to supporting the objectives of the EU waste legislation and are guided by the EU waste hierarchy.

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Monitoring framework for the circular economy (Communication, COM(2018) 29 final), Adopted on 11/07/2018

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In close cooperation with the EEA and in consultation with Member States, the Commission will develop a monitoring framework for the circular economy, designed to measure progress effectively on the basis of reliable existing data:

Indicators on

- Eco-design
- Development of (new) business models
- Collaborative economy
- Social indicators
- Emissions data



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Monitoring framework for the circular economy (Communication, COM(2018) 29 final), Adopted on 11/07/2018

Circular economy monitoring framework

1 EU self-sufficiency for raw materials

The share of a selection of key materials (including critical raw materials) used in the EU that are produced within the EU

2 Green public procurement

The share of major public procurements in the EU that include environmental requirements

3a-c Waste generation

Generation of municipal waste per capita; total waste generation (excluding major mineral waste) per GDP unit and in relation to domestic material consumption

4 Food waste

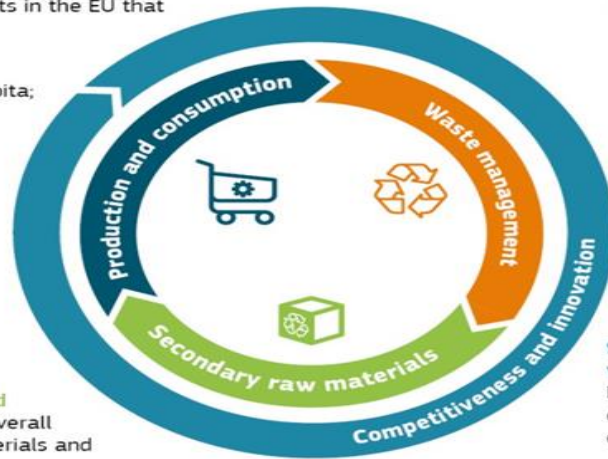
Amount of food waste generated

7a-b Contribution of recycled materials to raw materials demand

Secondary raw materials' share of overall materials demand - for specific materials and for the whole economy

8 Trade in recyclable raw materials

Imports and exports of selected recyclable raw materials



5a-b Overall recycling rates

Recycling rate of municipal waste and of all waste except major mineral waste

6a-f Recycling rates for specific waste streams

Recycling rate of overall packaging waste, plastic packaging, wood packaging, waste electrical and electronic equipment, recycled biowaste per capita and recovery rate of construction and demolition waste

9a-c Private investments, jobs and gross value added

Private investments, number of persons employed and gross value added in the circular economy sectors

10 Patents

Number of patents related to waste management and recycling



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Connecting matters



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