Cobalt Institute

Promoting the sustainable and responsible use of cobalt in all forms

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Circular Economy Perspectives for future End-of-Life EV Batteries,
Circular Impacts Workshop, Brussels 7 December 2017

Brief Overview: Key Messages & Feedback

- **Cobalt has many key uses** in addition to rechargeable batteries, which can support circular economy aims
- **Global versus European** – shows different pictures for use-volumes and value chains
- CRM (supply/demand and market access) – **Cobalt is mainly produced as a by-product** from Copper and Nickel production
- **Responsible Sourcing (artisanal mining?)** – new CIRAF currently under development
- **Numerous EU regulatory activities on cobalt compounds present implications (possible barriers) to CE aims…?**
- Through the new Cobalt LCA study and EU PEF Pilot project on rechargeable batteries – **Environmental aspects are now better understood and characterised**

Cobalt Institute (CI) – 60 years of history

27 Co
Cobalt

Health

Cobalt is an **essential** element for humans and forms part of vitamin B12.

Medicine

Cobalt-chrome alloys are used in orthopaedic and dental implants due to their **biocompatibility**, **high corrosion** and **wear resistance**.

Alloys

Cobalt superalloys are used in jet turbines, where **high temperature strength** is important.

Cobalt is used as a binder to produce cemented carbides - a material that is vital to the hard metal industry

Most Li-ion batteries used for portable electronic devices contain cobalt based cathode technology

Rechargeable batteries

Cobalt-based cathode technology is also vital for **sustainable technologies** including electric transport and renewable energy storage.

Magnets

Cobalt can be **magnetised**. When alloyed with aluminium or nickel it makes particularly powerful magnets.

Inks and Pigments

Cobalt salts have been used for centuries to produce **brilliant blue colours** in pottery, enamel and glass.

Electronic Components

Cobalt is used in many different areas of electronic technology, such as in integrated circuits and semi-conductors.

Catalysts

Cobalt has major uses as a **catalyst** in the petrochemical and plastic industries.

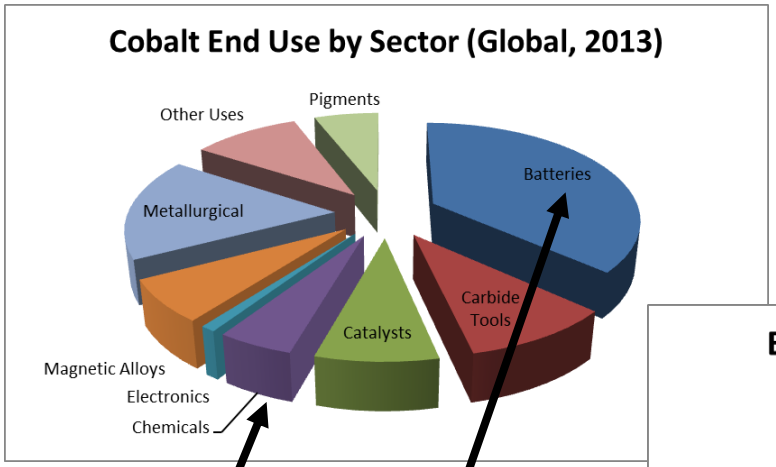
Plating

Cobalt is used in electroplating because of its **hardness**, **appearance** and **resistance to oxidation**.

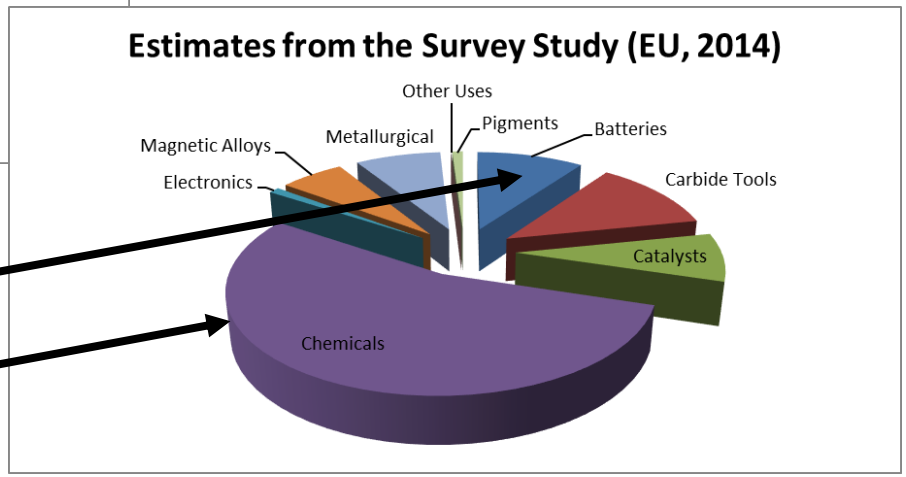
Broad Use Sectors & Value Chains

Collecting new information about the **use-volumes, material flows, and value chains for cobalt in Europe**. This shows a different overall picture of end-uses by sector in the EU and globally.

GLOBAL



EUROPEAN



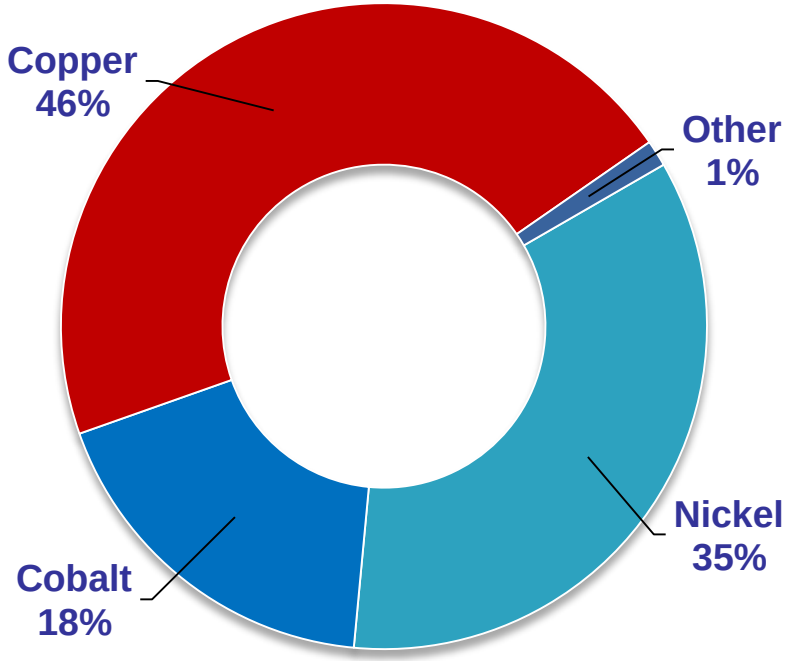
Batteries

Chemicals

Cobalt Production – mainly as a by-product

Current Refined Production Sources (CI):

(Source: Roskill estimate)



Current Refined Production Sources (CI – New):

(Source: CI estimate)

Nickel Industry	~	36%
Copper Industry & Other	~	58%
Primary Cobalt Operations	~	6%

Responsible Sourcing:

- International pressure from civil society
- Regulatory and policy pressures
- Artisanal mining is being poorly regulated
- LSM (large scale mining) responsible/sustainable working practices
- CI strategy = develop CIRAF (Cobalt Industry Risk Assessment Framework), working with RMI (Responsible Minerals Initiative), *inter alia*

  - Universal Declaration of Human Rights
  - United Nations Guiding Principles for Business and Human Rights
  - OECD Guidelines for Responsible Sourcing
  - Extractive Industry Transparency Initiative (EITI)
  - Equator Principles
  - Global Reporting Initiative (GRI)
  - ICMM Principles
  - CDI Principles

Regulatory activities – versus CE aims?

Five Cobalt Salts

- ECHA is developing a REACH Restriction proposal – *scope tbd…*

Cobalt Metal

- NL has proposed very conservative harmonised classification
- *For example, Carc 1B by all routes with very low SCL (0.01%) – poses serious implications for metals industry (uses and recycling)*
- NL also reviewing cobalt with tungsten in hard metal exposure

Tricobalt Tetraoxide

- NL has proposed Co3O4 (*with NiO impurity*) as SVHC for REACH Candidate List (potential future Authorisation) – *implications?*

Need for a more holistic approach and proportionality in Regulation

Environmental aspects – LCA and PEF

CI has completed first industry-led **Life Cycle Assessment** (LCA) 'cradle to gate' study for **global refined cobalt production**:

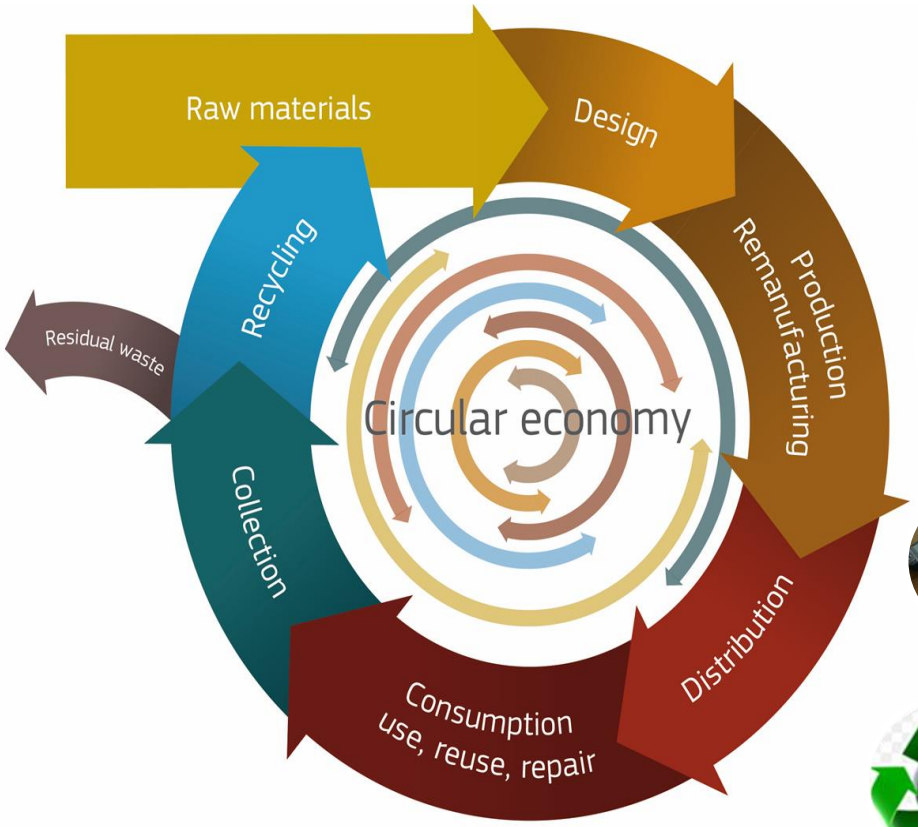
- better characterise the environmental effects (benefits)
- provide new life cycle inventory (LCI) data to replace existing (uncertain) data
- to support other LCA studies of cobalt-containing products.

CI is participating to **Product Environmental Footprint** (PEF) programme – Rechargeable Batteries pilot project

- PEF provides new approaches/tools to benchmark the environmental performance of products/services

Developing the profile for each key sector

Involves taking a **Life Cycle Approach**, and applying the appropriate tools, to illustrate the **Role of Cobalt** in the **Circular Economy**



COBALT PRODUCERS:
Sustainability Reporting (GRI, etc.),
Cobalt LCI-LCA Study

SUPPLY CHAINS:
Product Specifications, Eco-Design
Responsible Sourcing

END-USE SECTORS:
Product sustainability profiles,
Product Environmental Footprint

SECONDARY COBALT:
Collection Logistics, Recovery Technology
Data needs for EOL !

Source Eurometaux

Thank you

Cobalt Institute

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