

EDA Materials & Structures CapTech and
EDA's Incubation Forum for Circular Economy in European Defence (IF CEED)
Workshop "Circularity of Critical Raw Materials"

Venue (Webex virtual room)
- 15 March 2022, h. 10:00-17:30 -

Summary

The Workshop "**Circularity of Critical Raw Materials**" was organised under the **EDA-managed Incubation Forum for Circular Economy in European Defence (IF CEED)** and the **Materials & Structures CapTech** to discuss and assess how circularity can contribute to promoting strategic autonomy and boosting a digital, circular and climate neutral sustainable economy. The event gathered representatives from Member States' Ministries of Defence, the defence industry, research institutes and centres, foundations and universities.

In the general session, introductory contributions were made by European Commission's DG DEFIS and DG GROW, the Polytechnic of Turin, the European Institute of Innovation and Technology EIT RawMaterials, as well as the French Ministry of Defence.

In the "*Circularity by design, reuse and recycling*" session, the Fraunhofer Institute, ESM Foundation, STAM, the Łukasiewicz Research Network, as well as the Polytechnic of Turin, contributed to steer the discussion, while MBDA, Eurecat and RINA provided substantial contributions in the "*Critical Raw Materials Replacement*" session. Moreover, in the "*Investment in circularity*" session, the European Investment Bank (EIB), EDA and TNO provided relevant discussion points about funding, of uppermost importance for the development and implementation of project ideas.

Participants discussed circularity principles, including effects on criticality and materials stock and flows, and defence supply chain specificities, with a case study on Titanium. They also discussed concrete examples from industry, for instance how CRM could be recycled from Li-ion batteries and superalloys, or how alternative coatings could be used in the production of specific parts of defence equipment.

The IF CEED's joint discussions and activities, coupled with the identification of possible funding and financing sources, will help trigger concrete collaborative projects with a clear and coherent roadmap.

To this aim, specific inputs and discussions were boosted through open and closed polls in the “*Forming the project strands*” session.

The main discussion points dealt with along the workshop are summarised as follows:

- Concerning the **project idea** of analysing a **complex supply chain for defence to promote strategic autonomy, batteries** were the most scored option, followed by **permanent magnets** (e.g. Light and Heavy REE), **additive manufacturing** (to which IF CEED dedicates a specific working group) and **electronics**. Semi-conductors and drones were also proposed by some experts. Based on the discussions held during the specific sessions, the analysis of the Titanium superalloy value chain, as well as the one of Tungsten, appears of particular interest for the defence sector.
- Concerning the **project ideas on circularity by design, reuse, recycling and replacement to boost a digital, circular and climate neutral sustainable economy, Cobalt, Titanium and Tungsten** received the highest number of votes, also in line with the proposals for the complex supply chain analysis. Lithium, Magnesium, Beryllium, Light REE (Neodymium and Praseodymium) and Tantalum also received a substantial number of proposals. Finally, Platinum, Vanadium, Dysprosium, Yttrium and Silicon metals were also mentioned as relevant. Among the raw materials relevant for defence, but not classified as critical in the CRM list 2020 reported in the [Critical Raw Materials Action Plan \(CRM AP\) \(2020\)](#) or in the [EC foresight study 2020](#), **Nickel, Rhenium and Chromium** were mainly mentioned. Chromium is particularly relevant for coatings and its replacement with a material of similar properties is an issue.
- Finally, it was highlighted that certain CRM appearing to be relevant for defence, such as **Antimony**, Natural Graphite or Scandium, may deserve further in-depth analysis, although they are not included in the EC foresight study 2020.

In the closing remark session, it was announced that:

- the second CRM Project Circle meeting to discuss the preliminary project ideas arisen from the workshop will take place on **11 May 2022** (on Webex);
- the presentations will be made available in a dedicated ECP workspace; and
- the IF CEED annual conference will take place in Luxemburg on **6-7 September 2022**.