Beryllium Science & Technology Association

Brussels, 22 November 2022

BeST Position Paper to the Call for evidence on the European Critical Raw Materials Act

Introduction

BeST welcomes the European Commission's proposition of creating a European Critical Raw Materials Act to address the challenges associated with the sourcing of critical raw materials (CRMs) essential for the green and digital transition.

While the urgency of the European Critical Raw Materials Act is undeniably connected to the current geopolitical context, CRMs have a pivotal role in guaranteeing the well-being of our society, the excellency of EU products and the competitiveness of industry, and therefore their unique properties must be carefully considered when drafting policy.

BeST's recommendations

Beryllium has been classified as a CRM since the first EU CRM list in 2011. Similarly, beryllium has been included in strategic and critical materials lists in other jurisdictions, i.e. U.S., Japan, Australia, India, etc. It is important to note that beryllium is the only raw material classified by the U.S. as both critical and strategic even though the U.S. has a significant internal supply of beryllium from ore to metal.

BeST encourages the European Commission to identify beryllium as a strategic raw material in the frame of the development of the Critical Raw Materials Act:

- ***A realistic understanding of the sourcing of the strategic material is necessary*:** According to BeST's knowledge, there are limited reserves of beryllium in its territory and none of the reserves are exploitable as the necessary infrastructures and technologies for mining and refining are currently unavailable/inexistent. It is, therefore, inevitable that the EU will need to continue to import beryllium from its trade partners in the medium to long term. Each strategic material on the EU CRM list presents different sourcing challenges dictated by the technologies used, the location of the reserves, the concentration of the reserves, trade relations with mineral-rich countries, the level of demand of the material and the level of social acceptance. All these elements must be considered when developing policy actions to tackle the sourcing challenges of CRMs.

- ***Understanding the properties and use of the commodity:*** The importance of a strategic material for the EU is directly determined by its properties and use. Most of these materials have unmatched intrinsic properties that do not exist in other materials. Beryllium is a lightweight, stiff, electrically conductive, thermally stable material with non-sparking properties. The combination of these intrinsic properties make it ideally suited for a range of life-saving and critical applications as well as commercial applications. Beryllium and beryllium-containing alloys are used in connector equipment in all transport, satellites and telescopes (i.e. James Webb Telescope), life-saving medical devices and aerospace and defence applications. Beryllium is also used as an additive to produce and recycle light magnesium-containing alloys. Without beryllium, production and recycling of these AlMg and Mg alloys would be relocated outside the EU. Policymakers responsible for identifying strategic CRMs must therefore understand and thoroughly consider the properties and use of the materials considered to avoid dire unintended consequences.

- ***Common solutions often do not work:*** Policymakers should avoid common solutions frequently presented as the "silver bullet", including substitution and recycling. Indeed, these solutions are often inefficient when applied to all strategic materials indistinctively. Given the challenges and costs associated with its sourcing and processing, beryllium is an expensive material. Consequently, market forces have automatically prompted the substitution of beryllium with other materials whenever possible. The continued use of beryllium in numerous applications, including those mentioned above, is therefore justified by the absence of availability of any other material with similar intrinsic properties and performance, especially in cases of life-saving applications where failure is unacceptable. In reference to recycling, very small amounts of beryllium are normally used as alloying element to improve the properties of other materials, i.e. copper-beryllium alloys - where beryllium extensively improves the strength of copper without impairing its conductivity. The very small amount of beryllium used renders it very difficult to locate and retrieve the material from end-of-life applications. The collection and recycling of beryllium is therefore technically and economically not feasible.

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- ***Trade-offs must be considered:*** The Critical Raw Materials Act must acknowledge and consider trade-offs. Indeed, despite the low-recycling rate of beryllium and the non-substitutability of the material in strategic applications (as mentioned in the above points), products containing beryllium do not fail over time and maintain a high level of performance. Consequently, beryllium substantially contributes to the longevity and circularity of these products.

- ***Competition and connections between applications and sectors:*** CRMs are used in a wide range of competing applications and sectors. As the EU does not have sufficient and secure supply of these materials, the different industrial sectors are often competing to secure the needed supply of the materials. Consequently, a thorough understanding of the properties and use of the materials will also allow policymakers to comprehend how policy actions can impact the different sectors and the potential spill over effects on the EU industry. For example, the current geopolitical context has raised several concerns on the EU's defence capabilities and the need to secure the necessary materials for the sector. Beryllium has a large number of defence and aerospace applications, and therefore is considered a strategic material of vital importance for the sector. The production of beryllium for the defence and military sector is directly connected to the commercial applications of beryllium. Indeed, the revenues of the latter allow to offset the costs associated with the former. Consequently, policy actions curtailing the use of beryllium in commercial actions will potentially jeopardise the availability of the material for the defence sector.

- ***All possible solutions should be considered:*** Considering the critical and strategic importance of critical raw materials, including beryllium, for all key EU industrial sectors (electronics, defence, aerospace, automotive, medical devices, etc.), all possible solutions and opportunities to secure the sourcing of these materials should be considered and implemented. This must include trade partnerships, boosting primary production in the EU, enhancing secondary production where possible and economically feasible, as well as stockpiling.

- ***Chemicals Regulations:*** CRMs are generally addressed under several regulatory frameworks. A regulatory decision-making based on a stepwise process, which includes a socio-economic impact assessment, a risk-based approach, use of evidence-based data - also provided by industry - and evaluation of existing risk management measures, should be preferred when addressing CRMs. Phasing out of CRMs with hazardous classifications in environmental and waste legislation contradicts their importance to the EU economy and competitiveness.

Conclusions

The Critical Raw Materials Act constitutes the EU's ultimate opportunity to develop efficient and effective policy actions to finally address the challenges associated with the supply of CRMs. To do so, the above considerations must be taken into account, including acknowledging that a "one size fits all approach" is not possible and commodity-specific actions may be necessary.

Considering the above points, beryllium is a strategic and critical material and complies with the pre-set criteria identified in the call for evidence, i.e. economic importance, supply concentration, demand substitution, strategic applications and forecasted supply gaps. Beryllium's economic importance has been demonstrated in all criticality assessments since the first EU CRM list in 2011 while its supply concentrations are located in a limited number of countries (i.e. U.S., China..). Moreover, given the cost of the material, beryllium is generally exclusively used in those end-use applications where substitution is simply not possible without substantial loss of performance with dire consequences in case of life-saving applications. Beryllium has several important and strategic applications in a range of different sectors, including defence, energy transition, and digital. Due to beryllium's superior properties as a lightweight, stiff and thermally stable material, it is ideally suited for mission critical aerospace and military applications where low weight and high rigidity are essential. Beryllium, mainly used as an alloying element (2% maximum) in copper, is also essential for the reliability and durability of connector equipment, essential in all transportation equipment, including electrical and hydrogen vehicles. No-fail aircraft electrical and electronic copper-beryllium connectors enable fly-by-wire commercial airliners to achieve fuel efficiencies. Finally, beryllium is used in the development of the infrastructures for 5G and 6G technology. In terms of forecasted supply gaps, the potential increase in demand of beryllium at EU and International level, coupled with competing commercial and non-commercial end-use applications, could potentially cause supply disruptions of the material with the risk that certain sectors or applications are no longer supplied.

BeST remains available to provide additional information upon request.

Beryllium Science & Technology Association

About BeST

The Beryllium Science and Technology Association (BeST) represents the manufacturers, suppliers and users of beryllium metal, beryllium containing alloys and beryllium oxide ceramics in the EU market. BeST has the objective of promoting sound policies, regulations, science and actions related to the safe use of beryllium and to serve as an expert resource for the international community on the benefits and criticality of beryllium applications. It is also the objective of BeST to promote good practices in the workplace to protect workers handling beryllium containing materials.

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