EIT RawMaterials
KAVA Call 10
Lighthouse Appendix

March 2022

1. Definition and scope of Lighthouses

The EIT RawMaterials' activities and project portfolio are developed along three guiding strategic frameworks, called Lighthouses.

1. Responsible Sourcing
2. Sustainable Materials
3. Circular Societies

Lighthouses (hereafter 'LH') are large-scale and long-term coordinated innovation initiatives that address critical and specific raw materials challenges for Europe. They are mission approaches to innovation and education challenges, directly steering KIC activities towards the achievement of its strategic objectives and impact KPIs. LHs will generate tangible solutions for societal challenges that have raw materials at their core. In doing so, they will raise awareness about the role and importance of raw materials and create a positive perception about raw materials and their associated industries. The LH also present the thematic framework for the KAVA Calls in terms of project topics and focus areas.

The scopes, strategies and operational actions of the abovementioned LHs are summarized in Sections 3.1, 3.2 and 3.3. Additional information on the LHs and their strategic significance for the KIC can be found in the *Strategic Agenda 2021-27 of EIT RawMaterials* and the recently-updated EIT RawMaterials LH document.

2. Critical and Strategic Raw Materials

For a list of Critical Raw Materials, see the current 2020 EU CRM list. The term Strategic Raw Materials refers to elements used/found in technologies for the EU Green and Digital Transitions.

3. Specific topics for proposals

3.1. Lighthouse Responsible Sourcing

Challenge: Europe is highly dependent on raw materials that are predominantly sourced overseas. Hence, Europe is vulnerable to scarcity and supply shortage, and there is an urgent need for increased exploration activity and the development of mining operations and processing capabilities. Furthermore—while reducing the environmental footprint and increasing circularity—the positive impact of these activities and their key enabling role for the EU's Twin Green and Digital Transition has to be clearly and transparently communicated, as social opposition to mining remains one of the biggest hurdles to investment and development in the raw materials sector.

Approach: The Lighthouse aims at boosting the responsible sourcing of critical and strategic raw materials in Europe. Three approaches are at the core of the Lighthouse Responsible Sourcing: i) achieving a more targeted and cost-effective exploration and quicker transition to operation; ii) reducing the environmental footprint of mining and processing; and iii) improving the efficiency of mineral and metallurgical processing.

In this context and aligning with the above-mentioned mission, the KAVA call 10 includes the following topics:

1. Exploration: data-driven decision making in the extractive sector
2. Mining and processing: responsible sourcing of materials
3. Future exploration, mining, and processing technologies:
    a. Advanced and fully integrated exploration – smart targeting of ore deposits
    b. Future mining – Increase safety and reduce the environmental footprint of mining operations (from early operation to post-closure)
    c. Mineral processing – improve efficiency and reduce emissions and CO_2-footprint

3.2. Lighthouse Sustainable Materials

Challenge: The choice and design of pre-cursor materials, intermediates, and advanced materials have a significant impact on the overall resource efficiency, footprint, performance, and cost of a product. At the same time, substitution is a disruptive intervention into an industrial ecosystem that comes with potentials and risks.

Approach: This Lighthouse focusses on the substitution of critical, toxic, and low-performance materials, i.e., at the elemental, materials, and processing levels. Key technological approaches include the modelling of materials and processes, alloy development, microstructure engineering, and resource efficient materials design and processing, including near-net-shape processing, e.g., 3D printing.

In this context and aligning with the above-mentioned mission, the KAVA call 10 includes the following topics:

1. Innovation in the substitution of critical, toxic, and low-performance materials
2. Additive manufacturing of materials, including powder development and microstructure engineering
3. Resource efficient design of materials

3.3. Lighthouse Circular Societies

Challenge: The concept of a Circular Economy has recently gained traction in Europe as a positive, solutions-based perspective for achieving economic development within increasing environmental constraints. Raw, processed, and advanced materials, from primary and secondary sources, are the backbone of the economy. A radical shift is required from linear to circular thinking. End-of-life products, so-called "waste" must be considered as a resource for new product cycles, while losses and stocks of unused materials must be minimised and valorised along the entire raw materials' value chains. In addition, business opportunities in strategically linking the processing of different materials' value chains must be considered to define the best circular solution from a systems point of view. This is defined as Industrial Symbiosis. Awareness of the benefits of closing material loops must be raised in society.

Approach: The Circular Societies Lighthouse focusses on innovation and education related to industrial symbiosis, design for recycling and life-time extension, end-of-life product recycling, as well as in the chain of custody (traceability, sustainability, transparency).

In this context and aligning with the above-mentioned mission, the KAVA call 10 includes the following topics:

1. Industrial symbiosis: turning waste resources into valuable industrial input materials
2. Design for recycling and life-time extension: optimise the design of materials and products to create a business case.
3. End-of-life product recycling
4. Chain of custody: improving the traceability, sustainability, and transparency of supply chains, including Life Cycle Assessment.