bbk1 Institute of Mining Engineering I

EMR Energy & Mineral Resources Group

RWTH AACHEN UNIVERSITY

Blue Mining
Breakthrough Solutions for the Sustainable Exploration and Extraction of Deep Sea Mineral Resources

Motivation and Background

Earth provides natural resources, such as fossil fuels and minerals, that are vital for Europe´s economy. As the global demand grows, especially for strategic metals, commodity prices rapidly rise and there is an identifiable risk of an increasing supply shortage of some metals, including those identified as critical to Europe's high technology sector.

In today's rapidly changing global economic landscape, mining in the deep sea, specifically massive sulphides at hydrothermal vents (fig. 1) and polymetallic nodules (fig. 2), has gone from a distant possibility to a likely reality within just a decade. The extremely hostile conditions found on the deep-ocean floor pose specific challenges, both technically and environmentally, which are demanding and entirely different from land-based mining.

Fig. 1: Seafloor Massive Sulphide Sample (Source: BGR)

Fig. 2: Polymetallic Nodules Sample (Source: BGR)

Blue Mining will provide breakthrough solutions for a sustainable deep sea mining value chain. This means to develop the technical capabilities to adequately and cost-effectively discover, assess and extract deep sea mineral deposits up to 6,000 m water depth. The control over these three capabilities is the key for access to raw materials, for decreasing EU dependency on resource imports and for strengthening Europe's mining sector and their technology providers.

Aims

Feasibility Studies

Economic Evaluation

Fiscal Incentives for Stimulation

Sustainability Aspects and Primary Resource Efficiency

Objective

Sustainable Management of Deep Sea Mineral Resources

Resource Sustainable Management and Economic Evaluation

Feasibility studies including economic feasibility (based on Cash Flow Models and expressed in Net Present Value (NPV), Internal Rate of Return (IRR) and other economic indicators) are a key aspect in any mining project. Therefore, the explored deep sea mineral resources, the mining plans and concepts and the technological developments of the Blue Mining project are analysed against economic feasibility. In addition to common approaches for the economic evaluation of mining projects, sustainability aspects and primary resource efficiency are also taken into account. Furthermore, fiscal incentives for the stimulation of a more sustainable economic evaluation are developed. The latter contributes to a more sustainable management of deep sea mineral resources.

http://www.bluemining.eu

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