



# StratOre – Efficient and sustainable extraction of strategic elements from Indonesian ore deposits

## CLIENT II – International Partnerships for Sustainable Innovation

The StratOre project aims to develop new processing and exploration concepts for the efficient extraction of strategic elements from Indonesian ore deposits. This is undertaken using three case studies representative of major Indonesian ore deposit types: one Fe-Ni laterite, one Fe-Pb-Zn skarn and one Cu-Ni-Co solid sulphide deposit. The goal here is to lay the groundwork for a 10 percent increase in metal recovery rates as well as the additional recovery of a by-product for each case study.

### Strategic metals for the German economy

Rare minerals and metals are essential raw materials for German industry, especially with regard to the energy transition and future technologies. These materials are commonly grouped together as economic strategic commodities (ESCs). Examples are the platinum group elements (PGEs), Ag, Co, Ga, Ge, In, Ni, Sb and Sc. In the absence of significant domestic production, German industry relies almost exclusively on global markets for a continuous supply of ESCs. However, the concentration of ESC production in a small number of countries means that this is associated with significant economic risks. For this reason, the German Federal Ministry for Economic Affairs and Energy (BMWi) has developed a national raw materials strategy with a view to increasing the security of supply of ESCs and thereby to secure the continued technological leadership of German industry in the global economy.

The aim of this project is to develop innovative concepts for the efficient extraction of ESCs from Indonesian ore deposits. This is to be achieved through three case studies: a Fe-Ni laterite deposit, an Fe-Pb-Zn skarn deposit and a Cu-Ni-Co solid sulphide deposit. The work on these case studies is divided into three stages. In the first stage, the spatial and mineralogical distribution of the ESCs in the respective deposits will be investigated in detail. The results are then to be used to design concepts for the exploration, extraction and processing of ESCs. These concepts will then be validated in the third stage by means of targeted research drilling and processing experiments. In the long term, the project is expected to lead to the widespread establishment of efficient ESC recovery from relevant



StratOre aims to develop new processing and exploration concepts.

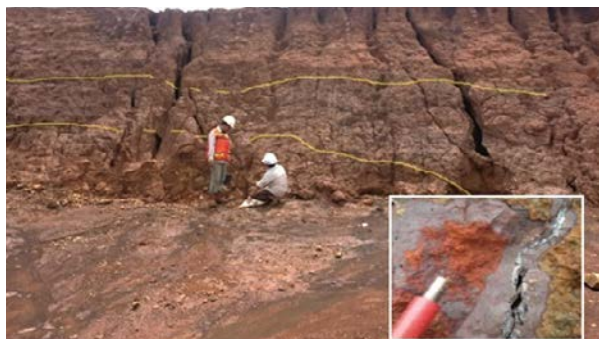
Indonesian ore deposits. The StratOre project therefore serves the goals of the BMWi's raw materials strategy by creating a broader basis for supplying the German economy with ESCs.

### Innovation through geometallurgy

The main innovation in the StratOre project lies in its mineralogy-based approach to geometallurgy and mineral processing. By integrating detailed mineralogical and mineral chemical data on the respective ore deposits exploration and processing techniques can be effectively optimised. This approach minimises the risks and errors that are common with the conventional approach. The resulting efficiencies have the potential to revolutionise mine planning and mining worldwide. This is particularly relevant for the lateritic deposits that currently make Indonesia the world's largest nickel producer. Ultimately, efficiencies such as those envisioned here will enable the development and implementation of more sustainable and responsible mining.

## Enhanced efficiency for Indonesian mines

The specific objective intrinsic to the project is the expansion of the product portfolio for each of the investigated ore deposits by at least one of the relevant ESCs (Ag, Co, Ni, Sc, Se, Sn, In and/or PGEs, depending on the work package) and an increase in the recovery of the currently produced metals of at least 10 percent. Both will reduce the volume of waste produced and the amount of CO<sub>2</sub> emitted per tonne of metal extracted. The Helmholtz-Zentrum Dresden-Rossendorf is leading the project consortium and will also carry out the coordination and investigations related to the laterite and skarn case studies. The Federal Institute for Geosciences and Natural Resources (BGR) is mainly responsible for the solid sulphide case study. Both Umwelt- und Ingenieurtechnik GmbH Dresden and UVR-FIA GmbH are responsible for the treatment tests. Indonesian partners will be closely involved in all the work and include Universitas Gadjah Mada, the National Geological Survey of Indonesia, P.T. Sebuku Iron Lateritic Ores und P.T. Kapuas Prima Coal.



Laterite profile from Sebuku Island showing the transition from ferricrete to limonite.

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### Project partner

Federal Institute for Geosciences and Natural Resources; Umwelt- und Ingenieurtechnik GmbH Dresden; UVR-FIA GmbH; Universitas Gadjah Mada; Indonesian National Geological Agency; P.T. Sebuku Iron Lateritic Ores; P.T. Kapuas Prima Coal

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