The GeoERA FRAME project focuses on several of the main raw material-related objectives of the EU Commission. FRAME work package 6 (WP6), targets so-called conflict minerals, chiefly those mined to extract niobium (Nb) and tantalum (Ta). These chemically related critical metals are essential components in a range of applications and products including electronics, steel alloys and superalloys widely required by the European industry. Today, significant amounts of Ta and associated Nb are sourced as conflict minerals from the central African region, not least the DRC (Congo-Kinshasa). A main objective of FRAME WP6 is to perform a survey of Nb-Ta occurrences and deposits across Europe and thus enhance their exploration interest and potential to help enable ethical and indigenous production for the EU. The main focus is put on the Swedish part of the Fennoscandian Shield and the Iberian Variscan Massif.

Focus areas - Iberia and the Swedish part of Fennoscandia

The Palaeoproterozoic Nb-Ta mineralisations, and most specifically those enriched in Ta, are typically associated with granites and specifically granitic pegmatites, known from the Palaeoproterozoic bedrock of the Fennoscandian Shield and several younger granites and granitic pegmatite fields in Europe (e.g. the Variscan belt of the Iberian Peninsula and the Massif central of France). Niobium is also present in pyrochlore-group minerals in carbonatitic as well as syenitic rocks, which have a more restricted distribution. In this work package, key areas and deposits on the Iberian Peninsula and in the Fennoscandian shield have been identified as possible candidates for more detailed studies and research. Research on the selected deposits includes field and laboratory studies in which the ore mineralogy of Nb-Ta will be addressed to maximise the usefulness with regards to processing and associated evaluation parameters of their economic potential. Potential by-products, not least of other critical or strategic metals and minerals will be assessed. An important aim of work package 6 is to establish relationships between mineralisations and associated granitic rocks and develop metallogenic models for their formation. The survey and its outcomes are aimed at forming the basis for developing recommendations for future exploration for these metals in Europe.

To conclude...

Based on available information in the databases and archives of the partner surveys, a list of Nb-Ta occurrences and deposits is being produced. Ultimately, at the end of the project, a report on the distribution and systematics of Nb-Ta mineralisations in Europe will also be produced. Prospective regions and their character of mineralisation will be summarized together with the overall European potential, in order to develop recommendations for future exploration. Furthermore, a discussion of conditions of Nb-Ta production in central Africa will be made. The potential of intra-European production of Nb-Ta to decrease the present near-total dependence on imports will also be assessed. As another outcome, an Inspire-compatible pan-European dataset of Nb-Ta mineralisations will be provided to the GeoERA information platform.