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Geological Surveys as multiplier for domestic exploration incentives - Austria's response to the Critical Raw Material Act

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One of the mitigations of climate change are net-CO_2 free energy supply capacities at a global scale. The substitution of fossil fuel exploitation comes, in the long run, with a net decrease of raw material demand. However, the building of renewable energy infrastructures can only be realised with an unprecedented supply of material from unexploited and unexplored geogene resource. The anticipated demand of raw materials crashes with a narrowing of supply chains, with China being the main factor. The EC Critical Raw Material Act (CRMA) formulates measures to fight raw material criticality: expanding supply chains, recycling and economizing materials, and fostering domestic raw material supply including exploration. Counter acting Europe's slow phasing out of primary resources extraction, the CRMA calls for "National Exploration programs". EU countries interpret these programs diversely; however according to EuroGeoSurvey national geological surveys are about to play key roles. The principal aim of the work of geological surveys in relation to mineral exploration is to provide relevant data at the pre-competitive stage. Only GTK in Finland has the responsibility of commercial exploration programs within the country. How is Austria reacting to the request of "National Exploration programs"? Currently, federally funded research on mineral resources at Austria's geological survey, GeoSphere Austria, is dominantly carried out within the frameworks of two research focus programs, "Vollzug des Lagerstättengesetzes VLG", since 1947, and "Mineralische Rohstoffinitiative, MRI", since the 2010s. The main aim are to conduct studies on mineralization processes and regional mineral potentials. In line with these aims, substantial geological, geochemical and geophysical measurements and sampling have been carried out. Now, Austria plans a new focus program, the "Exploration Initiative", in which GeoSphere Austria plays a strategic role to boost the availability of pre-competitive data on (critical and strategic) raw materials, deep geothermal heat, and carbon capture/storage. The ultimate aim is attracting industry by de-risking exploration investments within Austria. In order to generate these pre-competitive data with research projects, following approaches will be key to integrate: 1) provide system-wide and cross-border homogenized geological maps, 2) densify and reinterpret existing datasets with novel techniques, 3) unravel any systematics of raw material distribution and genesis applying a mineral system approach, and 4) develop and apply techniques in geophysical and geochemical anomaly detection, raw material discrimination and resource (semi-) quantification. Measures also include adopting the "United Nations Framework Classification" (UNFC) to domestic mineral deposits. Data will be made available via free-access reports/publications/data repositories. GeoSphere Austria as a research hub is seeking out to join forces with geological surveys of neighbouring country sharing geological data from prospective larger geological systems (e.g., the southern Bohemian massive and Eastern Alpine Drauzug-Gurktal nappe system). Research consortia with other research institution, such as Universities in Vienna, Leoben and Innsbruck are key for the utilization of fundamental scientific knowledge, e.g. on statistical data mining and ore genesis, and advanced analytical techniques. The alignment of research with industry and the mining authority enables project partners to access to mineral deposits and resource data, drilling, or aerogeophysical services.

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