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EU-funded ROBOMINERS project will improve access to European raw materials by developing a bio-inspired, modular and reconfigurable robot-miner for small and difficult to access mineral deposits

ROBOMINERS is a new project funded under the European Union's Research and Innovation programme Horizon 2020 (grant agreement n°820971) which aims at creating a bio-inspired robot capable of mining underground mineral deposits. The 48-months project has held its kick-off meeting in Madrid, on 13 and 14 June 2019.

The project has been set up with the long-term strategic objective to facilitate EU access to mineral raw materials - including also those that are considered as strategic or critical for the energy transition - from domestic resources, and decreasing thus the European import dependency. ROBOMINERS' innovative approach combines the creation of a new mining ecosystem with novel ideas from other sectors, in particular with the inclusion of disruptive concepts from robotics. The use of the robot miner will especially be relevant for mineral deposits that are small or difficult to access. This covers both abandoned, nowadays flooded mines, that are not accessible anymore for conventional mining techniques, or places that have formerly been explored but whose exploitation was considered as uneconomic due to the small size of the deposits or the difficulty to access them.

Within the project duration, the consortium aims more particularly at:

1. Constructing a fully functional modular robot miner prototype following a bio-inspired design, capable of operating, navigating and performing selective mining in a flooded underground environment;
2. Designing a mining ecosystem of expected future upstream/downstream raw materials processes via simulations, modelling and virtual prototyping;
3. Validating all key functions of the robot-miner to a Technology Readiness Level (TRL) 4;
4. Using the prototypes to study and advance future research challenges concerning scalability, resilience, re-configurability, self-repair, collective behaviour, operation in harsh environments, selective mining, production methods as well as for the necessary converging technologies on an overall mining ecosystem level.

Led by the Centre for Automation and Robotics (CAR) of the Universidad Politécnica de Madrid (UPM), ROBOMINERS will be implemented by a consortium of 14 partners from 11 European countries, that covers a wide range of actors and specialities, consisting of geo-scientific SMEs, academics covering both mining and robotics, non-governmental organisations, and governmental bodies. Each of the partners will contribute to the success of the project with their unique know-how.

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