MEDIA KIT

Version: November 2019

ROBOMINERS

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement nº 820971.

Press release I Madrid I July 2019

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.

Follow us:

Website:
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DEVELOPING RESILIENT BIO-INSPIRED MODULAR ROBOTIC MINERS

ROBOMINERS

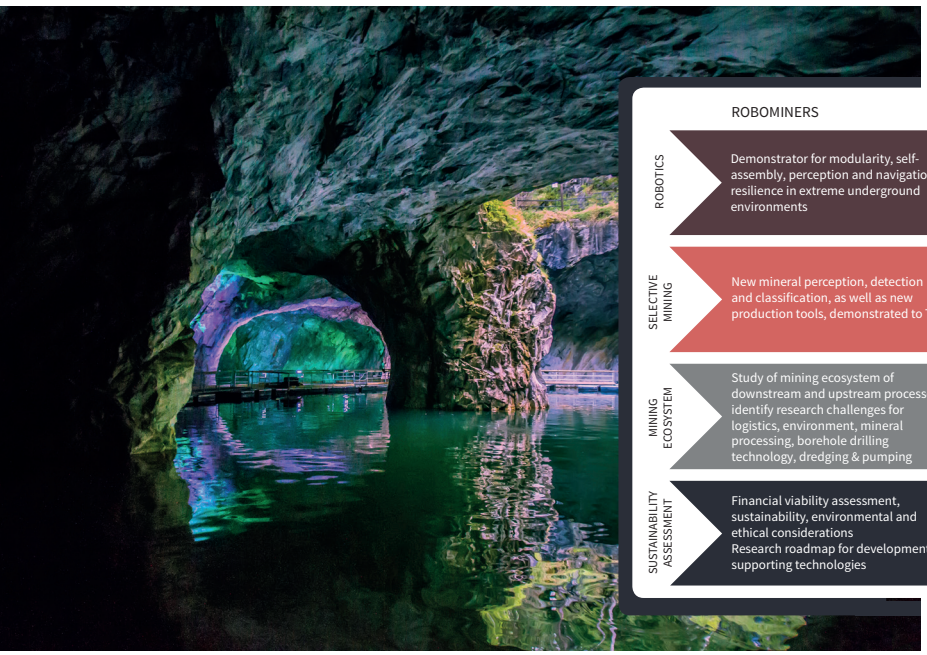
ABOUT ROBOMINERS

ROBOMINERS is a 48-months Horizon 2020 project funded by the European Commission that started on 1 June 2019. ROBOMINERS will develop a **bio-inspired, modular and reconfigurable robot-miner for small and difficult to access deposits**. The aim is to create a prototype robot that is capable of **mining underground, underwater in a flooded environment**, and can be delivered in modules to the deposit via a large diameter borehole drilled from the surface to the mineral deposit.

ROBOMINERS aims at delivering a proof of concept for the feasibility of this technology line at Technology Readiness Level (TRL) 4. The technology could **enable the EU to access mineral raw materials from domestic sources that are otherwise inaccessible or uneconomic**.

CONCEPT

- Robot parts (modules) are sent underground via a borehole
- They self-assemble to form a fully functional robot
- Using specialised sensing devices, they detect ore
- Using ad-hoc production devices, they produce slurry that is pumped out
- They can re-configure on-the-job



VISION

	ROBOMINERS	2030 VISION	2050 VISION
ROBOTICS	Demonstrator for modularity, self-assembly, perception and navigation, resilience in extreme underground environments	First industrial pilot, tethered, semi-autonomous operation	Full autonomy, self-reconfiguarbility, self-awareness collective robots
SELECTIVE MINING	New mineral perception, detection and classification, as well as new production tools, demonstrated to TRL	First industrial pilot application	Autonomous mining
MINING ECOSYSTEM	Study of mining ecosystem of downstream and upstream processes, identify research challenges for logistics, environment, mineral processing, borehole drilling technology, dredging & pumping	First industrial application in a „small deposit scenario" or „abandoned mine scenario" with on-site minerals processing and paste refilling	Industrial applications in „ultra-depth" scenarios Small mines deliver a considerable share of the EU's critical minerals production
SUSTAINABILITY ASSESSMENT	Financial viability assessment, sustainability, environmental and ethical considerations Research roadmap for development of supporting technologies	Simplified permitting procedures for small-scale mining Supporting policy and legal framework for small-scale mining	New innovation ecosystem: SMEs and entrepreneurs are working towards further miniturisation and versatility

PARTNERS

- UNIVERSIDAD POLITECNICA DE MADRID (UPM)
- TAMPERE UNIVERSITY
- MONTANUNIVERSITAET LEOBEN (MUL)
- ROYAL BELGIAN INSTITUTE OF NATURAL SCIENCES (RBINS)
- ASSIMAGRA
- EUROPEAN FEDERATION OF GEOLOGISTS (EFG)
- UNIVERSITY OF MISKOLC (UNIM)
- LA PALMA RESEARCH CENTRE FOR FUTURE STUDIES SL (LPRC)
- GEOLOGICAL SURVEY OF SLOVENIA (GeoZS)
- RESOURCES COMPUTING INTERNATIONAL LTD (RCI)
- GEO-MONTAN
- TALLINN UNIVERSITY OF TECHNOLOGY (TalTech)
- IGSMIE PAN
- K-UTEC AG SALT TECHNOLOGIES (KUTEC)

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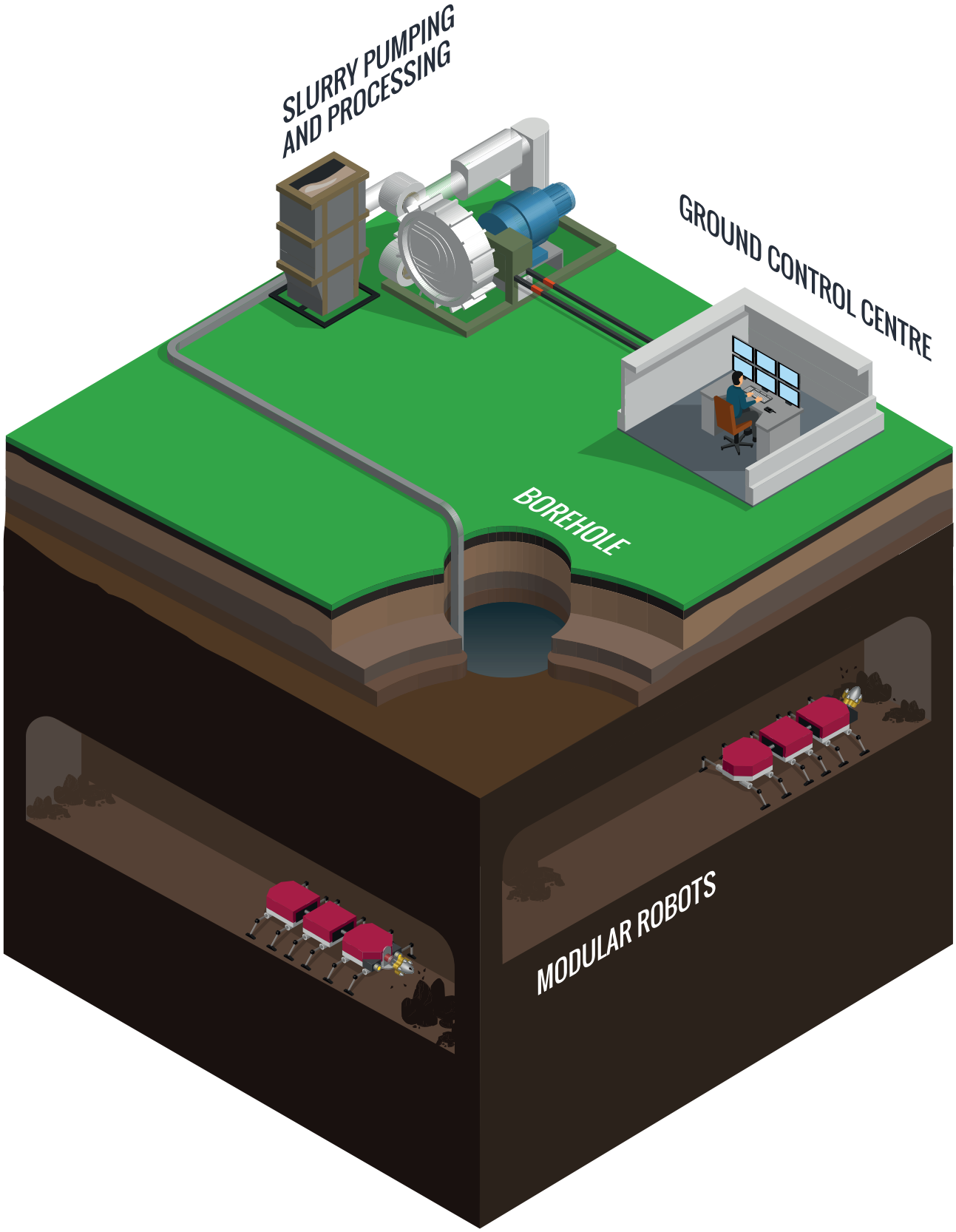
CONCEPT IMAGE



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