MINE.THE.GAP
OPEN CALL #1
OUTCOMES

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 873149

Topic: H2020-INNOSUP-01-2018-2020

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1. ABOUT MINE.THE.GAP AND THE 1ST OPEN CALL

MINE.THE.GAP is an innovation project funded by the European Commission as part of the INNOSUP programme. The project initiative is to fund in two open calls with Vouchers to reinforce synergies between raw materials mining SMEs and providers from the existing fields of ICT, Circular Economy, Resources Efficiency and Advanced Manufacturing.

In order to provide the direct financial support to SMEs through innovation vouchers, the **first open call** opened on 3 March 2021, and closed on 5th May, 17:00 CEST with two different direct funding schemes available: MINE-PoC (TRL6-7 and maximum 9-months duration) and MINE-Demo (TRL7-8 and maximum 12-month duration). Applocations were submitted digitally using the platform MINE.THE.GAP (https://h2020-minethegap.eu)

After the first open call closure, the submitted proposals were evaluated by a highly-qualified panel of external experts which led MINE.THE.GAP to rate the eligible projects. Rules and maximum funding per SME and per proposal detailed in MINE.THE.GAP first open call guidelines were applied to the selected companies (beneficiaries) and their projects.

Each beneficiary signed a separate funding contract, called "Third Party Voucher Grant Agreement" with MINE.THE.GAP. Since changes to the budget cannot occur under the contract agreement of the voucher, the selected SMEs are indirectly beneficiaries of European Commission funding. As such, they are responsible for the proper use of the funding and ensure that the recipients comply with obligations under H2020 specific requirements as described in Horizon 2020 - the EU Framework Programme for Research and The Awarded projects started by September 1st of 2021.

The current document contains the outcomes of the first MINE.THE.GAP open competitive call: description of the third party actions (projects), duration, and SMEs participants information.

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2. PROJECTS FUNDED UNDER THE 1ST OPEN CALL

This section aims to provide a description of the projects, the starting dates of the different awards, their duration, and the legal name and country of the involved SMEs. Table 1 shows the general overview of the funded projects.

TABLE 1- FUNDED PROJECTS OVERVIEW UNDER THE 1ST OPEN CALL

Code	Acronym	Scheme	Start date	Duration
MTG001	CERES PLAN DEM	MINE-Demo	01/09/2021	52 weeks
MTG002	MINDINGSOILS	MINE-Demo	01/09/2021	52 weeks
MTG004	DMS	MINE-PoC	01/09/2021	36 weeks
MTG006	TRIM	MINE-Demo	01/09/2021	52 weeks
MTG007	EXPOMINE	MINE-Demo	01/09/2021	52 weeks
MTG009	OSH2S	MINE-Demo	01/09/2021	52 weeks
MTG011	WeARDMine	MINE-Demo	01/09/2021	52 weeks
MTG012	COLENPRO	MINE-Demo	01/09/2021	36 weeks
MTG013	CELABDEN	MINE-PoC	01/09/2021	36 weeks
MTG014	DIGIROCK	MINE-Demo	01/09/2021	48 weeks
MTG018	QuarrySenseX	MINE-Demo	01/09/2021	52 weeks
MTG019	OBIWAM	MINE-Demo	01/09/2021	52 weeks
MTG020	Molecule XRF	MINE-Demo	01/09/2021	52 weeks
MTG022	SmartMill	MINE-Demo	01/09/2021	52 weeks
MORE THAN 1.3M€ FUNDED FOR THE FIRST OPEN CALL PROJECTS				

Moreover, the funded projects EU distribution is shown in Figure 1.

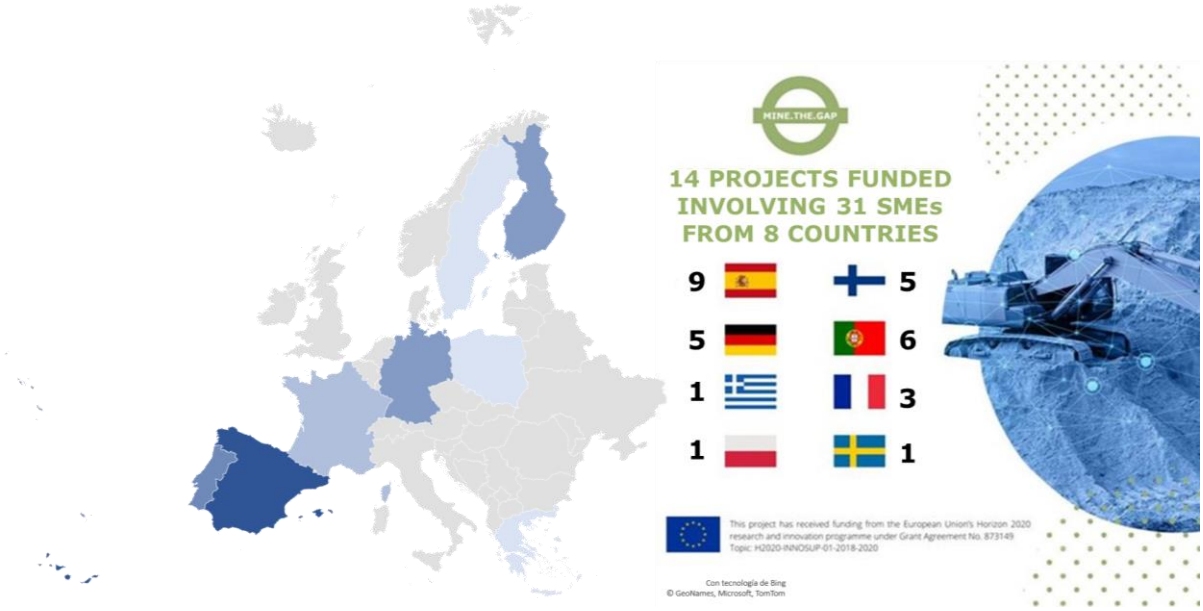

FIGURE 1-FIRST OPEN CALL FUNDED PROJECTS EU DISTRIBUTION

MTG001-CERES PLAN DEM

Title:	CERES Demonstration Planning - Saxore Bergbau		
Scheme	MINE-Demo		
Vertical sectors addressed	Space/Digital		
Challenges tackled by SMEs	- Environmental footprint - Social license to operate - New innovation technologies		
Start date	01/09/2021	**Duration**	52 weeks
Project partners	Cybele Lawgical Lda, *Leader*, Provider, Portugal, Space/Digital		
	Saxore Bergbau GmbH, Adopter, Germany, Mining		

Abstract

The mining industry faces major challenges related to waste management and pollution mitigation. Environmental compliance has become a top priority concern for the sector. Mining stakeholders devote an important and growing part of operational expenses to develop best practices and to achieve the highest environmental, social and ethical standards in order to obtain and maintain a Social License to Operate (SLA). Moreover, national regulatory frameworks are becoming increasingly stringent, concerning both the environmental legal requirements and the liability burden associated with potential remediation of damages.

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For more than a year, CybELE has been developing an innovative solution to support the mining sector with the monitoring of environmental status and compliance. Its technical base is a combination of software/web technologies with EO & GIS (Earth Observation and Geographical Information Systems) engineering. The result, CERES, offers a digital system providing satellite-based environmental compliance monitoring service for mining and extractive activities.

Saxore Bergbau GmbH is a mining company focusing on the extraction of critical raw materials in Saxony, Germany. The company aims to become an industry leader with the highest social and ecological standards as well as a frontrunner in the integration of innovative technological solutions. In its strategy to implement state-of-the-art innovative solutions in the area of environmental monitoring, Saxore Bergbau GmbH is interested to adopt the CERES service from the earliest phases of its mining life cycle.

MTG002-MINDINGSOILS

Title:	**Artificial soils with biochar applied to prevention of Acid Mine Drainage (AMD) within circular economy framework**		
Scheme	MINE-Demo		
Vertical sectors addressed	Circular economy		
Challenges tackled by SMEs	- Environmental footprint - New innovation technologies - Sustainable sourcing and Circular economy		
Start date	01/09/2021	**Duration**	52 weeks
Project partners	EDAFOTEC SL, *Leader*, Provider, Spain, Circular Economy		
	IBERO MASSA FLORESTAL S.A., Provider, Portugal, Circular Economy		
	THARSIS MINING SL, Adopter, Spain, Mining and Raw Materials		

Abstract

The aim of MINDINGSOILS project is to demonstrate through a pilot test, innovative green-technologies in the field of mining restoration and closure to prevent Acid Mine Drainage (AMD). The technology applied in the project is based on Artificial Soils, made with organic and inorganic residues from the mine and

nearby areas. The applied technology will promote mining wastes reuse, promoting the Circular Economy through an environmentally sustainable solution.

Biochar, an organic amendment produced by pyrolysis of biomass with a high adsorption capacity for organic pollutants and metals, is foreseen to be used in the elaboration of the artificial soils. In addition, the use of biochar in soils, due to its high structural stability, means that microorganisms take a long time to decompose, creating a carbon sink.

The European companies involved in the project can count on extensive and demonstrable experience in the mining environment. The consortium will be formed by three SMEs: two technology providers, EDAFOTEC (Spain) and IMFLORESTAL (Portugal) and one adopter, THARSIS MINING (Spain). The methodology developed will be applied as a pilot test for the first time at a mining area in Spain and even across Europe, being a very promising opportunity for the future of the sector.

MTG004-DMS

Title:	**Improving European Small Scale Mining Efficiency through Digitalisation: The Digital Mine Suite**		
Scheme	MINE-PoC		
Vertical sectors addressed	Mining ICT		
Challenges tackled by SMEs	- Social license to operate - Towards the digital world		
Start date	01/09/2021	**Duration**	36 weeks
Project partners	Rovjok OY, *Leader*, Provider, Finland, Mining ICT		
	P.E-W. GRYSOL SC, Adopter, Poland, Small Scale Mining		

Abstract

This project aims to promote digitalization and ICT adoption within Polish small-scale mining operations, to improve SME competitiveness and contribute to increased resources efficiency, while helping to drive improved and standardised levels of financial and environmental reporting (Social License to Operate).

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ROVJOK's "Digital Mine Suite" tool will be deployed within a small-scale aggregates/limestone mining operation in Poland's Świętokrzyskie region (Grysol), to provide a platform that enables data-capture, analytics and decision support for forecasting, prediction, and planning/budgeting within their operations. Ultimately, this will facilitate improved mineral extraction efficiency, OPEX reduction or environmental footprint reduction (i.e., Artificial Intelligence, Machine Learning, simulation tools).

Standardised Polish regulatory and reporting requirements will be built into the tool, providing the basis for automated financial and environmental reporting by Polish small-scale miners. Following incorporation of these key jurisdictional specific elements into the Digital Mine Suite it is envisaged that this tool will then be demonstrated to the wider Polish small scale mining market—where it can be easily scaled to promote wider technology adoption.

MTG006-TRIM

Title:	**InTerconnected ElectRIc Breaker HaMmer**		
Scheme	MINE-Demo		
Vertical sectors addressed	Mining ICT		
Challenges tackled by SMEs	- Environmental footprint - Towards the digital world - New innovation technologies		
Start date	01/09/2021	**Duration**	52 weeks
Project partners	Lekatech OY, *Leader*, Adopter, Finland, Raw Materials & Mining		
	Vemcon GmbH, Provider, Germany, ICT		

Abstract

Hydraulic breaker hammer (HBH) has been the default technology in construction, mining and demolition sites for the last five decades for breaking structures. However, HBH possesses some fundamental limitations such as: low level of efficiency, poor adjustability and control of impact, high maintenance costs, and massive amounts of hydraulic oil spills, among others.

This project co-creates, develops and pilots an Interconnected Electric Breaker Hammer (IEBH) demonstrator that is based on Lekatech's Electric Hammer (FI) enhanced with Vemcon's unique machine control solution (DE), for usage in underground mines. IEBH provides a relief to all the limitations of HBH technology. It reduces CO2 emissions up to 100%, saves energy up to 60%, ends oil spills and excessive consumption of hydraulic oil, is fully adjustable, increases safety through automated support, lowers noise and tremor levels, provides significant life-cycle-cost savings (80000 EUR/hammer in 4 years), increases performance and precision, allows adjusting striking sequence, and provides synchronized hammering possibilities.

During the project, IEBH will be validated in a real production environment in collaboration with supporting organization Normet, a global leader in scaling machines in underground mining. The project enables Lekatech and Vemcon to take their first collaborative, strategic and practical step towards commercializing its radical innovation.

MTG007-EXPOMINE

Title:	Platinum and Rare Earths Exploitation from Mine Tailings		
Scheme	MINE-Demo		
Vertical sectors addressed	Raw Materials		
Challenges tackled by SMEs	- Environmental footprint - Sustainable sourcing and circular economy		
Start date	01/09/2021	**Duration**	52 weeks
Project partners	MONOLITHOS Catalysts and Recycling Ltd, *Leader*, Provider, Greece, Raw Materials		
	IP Control SL, Provider, Spain, Raw Materials		
	Pizarras Matacouta SA, Adopter, Spain, Mining & Metallurgy		

Abstract

The mining and metallurgical sector generates vast amounts of residues, processing by-products and waste, with large volumes of these streams to have

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been accumulated in landfills. With the new technological advances in the field of mining and metallurgy, it is now possible to recover valuable elements from this kind of waste, thus unlock their untapped potential.

The valorisation potential in Europe is large enough to secure an extra supply of recycled materials for end-use applications in this area. Therefore, instead of landfilling these sources, a beneficiation methodology is proposed within EXPOMINE project including, pre-treatment of the tailings provided by PIZARRAS MATACOUTA for effective analysis and quantification of the beneficiation potential and the recovery of Platinum and Rare Earth elements using a low acidity process developed by MONOLITHOS.

EXPOMINE aligns with circular economy operation principles, offering substantial value by the exploitation of a residual material source. The project will trigger and assess, by IPCONTROL, the social, environmental and economic prosperity of the EU by easing the situation in disposing mining waste and contributing in the securement of the supply chain of critical raw materials which are primarily imported in the EU from third countries. The supply of these metals is critical for the EU which currently faces an increasing supply/demand deficit.

MTG009-OSH2S

Title:	**Open source smart hydrogen sensor for exploration and storage**		
Scheme	MINE-Demo		
Vertical sectors addressed	Energy & Signal Processing		
Challenges tackled by SMEs	- New value chain - Environmental footprint - Sustainable sourcing and circular economy		
Start date	01/09/2021	**Duration**	52 weeks
Project partners	Collaborative Energy SAS, *Leader*, Provider, France, Energy & Signal Processing		
	Hydrogène Naturel SARL, Adopter, France, Exploration		
	Converge! Lda, Adopter, Portugal, Storage		

Abstract

The EC set a key challenge to drastically reduce GHG emissions; this challenge relies among others to hydrogen, seen as a powerful energy vector, on one side to replace carbonated fuels and on the other side to store energy from renewable sources.

Carbon-free natural hydrogen (color-coded as white) will contribute to meet this key EC challenge. Natural hydrogen is a hydrogen that can be found underground. It is constantly generated by inorganic geochemical processes, therefore making it a renewable and sustainable resource, with a great potential in Europe.

Hydrogen storage in geological formations is also a major solution for the coming decades, with hundreds of storage sites required only in Europe to meet EC challenge. Exploration, extraction and storage of hydrogen is considered as an integral part of the mining and raw materials sector since both exploration and extraction are stages of the value chain of raw materials and natural hydrogen is considered a raw material that can be extracted and process (fractionate).

The proposed action consists in developing and testing in the field an innovative, efficient, reliable, accurate and ruggedized continuous hydrogen monitor based on metal insulated semiconductor (MIS); this monitor will be entirely manufactured locally; it falls within the ICT Key Action (smart mining and raw materials technologies for explorations).

MTG011-WeARDMine

Title:	**Wearable Aereal Robots for Digital MINEs**		
Scheme	MINE-Demo		
Vertical sectors addressed	ICT		
Challenges tackled by SMEs	- Skilled workforce - Health and safety - New innovation technologies		
Start date	01/09/2021	**Duration**	52 weeks
Project partners	Comet Gesinco SL, *Leader*, Provider, Spain, ICT		

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	UAV Autosystems Hovering Solutions España SL, Adopter, Spain, ICT
	Terranigma Solutions GmbH, Provider, Germany, ICT

Abstract

WeARDMine will create a wearable-like personal aerial robot with autonomous capacities, able to aid in underground mining scenarios, focusing on developing the potential of digital mines. Also, it will raise awareness, knowledge and acceptance regarding working with autonomous robots in underground mining scenarios. Two of the biggest challenges for the digitalization of the mining sector are, having homogenized data that allows sending information in real time and the capability to process this data in order to make helpful decisions at management level.

In underground mines, the deployment of a reliable communication network and the improvement of working conditions are also challenges to be tackled. The integration of digital technologies is then a priority to improve the productivity, safety and sustainability of the mining industry, contributing to the growth of the sector and its environment. WeARDMine can serve as the first step to start the digitalization of a mine and to enhance existing ones, no matter their digitalization level.

Through this project, COMET & Terranigma will work together with HOVERING to convert their UAVs for underground mining operations to develop a highly usable and modular robot which will have a direct impact in the reduction of costs, prevention of human errors, improvement of inspection and maintenance quality and efficiency, avoidance of accidents and even contribute to the environmental impact.

MTG012-COLENPRO

Title:	Technical & Economic assessment for the improvement in the use and enrichment processes of critical Raw Materials
Scheme	MINE-Demo

Vertical sectors addressed	Mining Process Engineering & Equipment Manufacturer		
Challenges tackled by SMEs	- New value chain - Health and safety		
Start date	01/09/2021	**Duration**	36 weeks
Project partners	Advanced Mineral Processing SL, *Leader*, Provider, Spain, Mining Process Engineering & Equipment Manufacturer		
	Minas de Cassiterite Sobreda SA, Adopter, Portugal, Mining		

Abstract

Nowadays the Niobium and Tantalum Metal Ore (the so-called Coltan) has become a strategic mineral whose demand has increased exponentially worldwide. Currently, there are some small up and running exploitations in which, the presence of this mineral could be remarkable. The key factor in these processing plants is to reach an easy to handle, profitable and straight forward way to separate and enrich this profitable mineral.

Advanced Mineral Processing, S.L. as a Process Engineering Company, highly qualified and specialist in Metal Ores beneficiation processes, through this project it aims to establish the best and safest process path, as well as accurate and reliable, able to reach a final concentrate of Nb & Ta Ore with the highest grade and, thereby, proceed with a further manufacturing, shaping and tuning of the most suitable pilot plant for the processing of this valuable Mineral carrying out also the separation of this one from other minerals as per Tin, Ilmenite, Rutile and Iron Ores.

Minas de Cassiterite de Sobreda, based in Portugal, exploits a Cassiterite Mine in which some amount of Coltan Ore has been detected. This Company requires the implementation of a most profitable and workable technology to make the most of his current deposit for the beneficiation of this valuable Metal Ore present in its deposit, producing a final refined and enriched concentrate able to be saleable in the usual sales channels.

MTG013-CELABDEN

Title:	**Optimization at laboratory scale of Celestite Mineral concentration using dense media in a Hydrocyclone system**

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Scheme	MINE-PoC		
Vertical sectors addressed	Mining Process Engineering & Equipment Manufacturer		
Challenges tackled by SMEs	- New value chain - Sustainable sourcing and circular economy		
Start date	01/09/2021	**Duration**	36 weeks
Project partners	Canteras Industriales SL, *Leader*, Adopter, Spain, Mining		
	Advanced Mineral Processing SL, Provider, Spain, Mining Process Engineering & Equipment Manufacturer		
	Minas de Cassiterite Sobreda SA, Adopter, Portugal, Mining Process Engineering & Equipment Manufacturer		

Abstract

The Montevive Celestite deposit is the largest reserve in Europe of this economically important strontium ore, which has been recently classified as a critical raw material. Canteras Industriales,S.L., the company that operates the mine, has traditionally processed only high-grade mineral (>80 % celestite).

This project aims to use low–medium grade mineral (60-69 %), accumulated in the mine tailings and dumps, after a concentration process. Preliminary studies have demonstrated that the most adequate and effective method to concentrate the Celestite mineral is by gravity separation using a high-density media in a hydrodynamic regime with a hydrocyclone system. The main objective of this proposal is the optimization of parameters of the concentration process before scaling up to a semi-industrial pilot plant developed by the partner company (Advanced Mineral Processing, AMP).

MINAS CASSITERITE SOBREDA, SA will be the supplier of Ilmenite (heavy mineral necessary for the concentration of Celestite ore at low cost).Relevant parameters of plant operation such as celestite mineral granulometry, feeding rate, heavy mineral suspension composition, flow rate needed to be controlled and optimized. The celestite mineral concentration and recovery plant would reduce mine operation costs avoiding blasting and clearings, ground displacement, generation of new residues and reducing fuel consumption. It would minimize the impact on the environment making the mine operation more sustainable and eco-friendlier.

MTG014-DIGIROCK

Title:	Digital Rock Sensing System		
Scheme	MINE-Demo		
Vertical sectors addressed	ICT		
Challenges tackled by SMEs	- Health and safety - Towards the digital world		
Start date	01/09/2021	**Duration**	48 weeks
Project partners	ThingWave AB, *Leader*, Provider, Sweden, ICT		
	AMS Solutions Ltd, Adopter, Finland, ICT		

Abstract

The use of rock bolts in the mining industry is a widely used approach for increasing mine stability, and each year millions of rock bolts are installed worldwide. Even with progress in material and load bearing capabilities in recent years, there is still room for major improvements.

However, rock bolts can still become damaged, either by seismic activities or movements within the rock. When a bolt is damaged, it can lose its loading bearing capacity. If that happens, the outer shell of a tunnel's walls or ceiling can collapse, with disaster as a result. Therefore, there is a clear need for online and real-time monitoring solutions for elongation and thereby stress, as well as seismic activity. Rock bolts with the capability to monitor elongation and seismic activities can warn about pending danger as well as provide a safer and thus more attractive working environment for miners.

This project proposal aims to develop an early warning system for underground mining. The goal is to implement a first proof-of-concept solution for both real-time monitoring of rock bolts, and advanced analytics with predictions of future rock deformations. The proposed technology can both save lives, mitigate working environment hazards and increase productivity. At the end of the project, we aim to deliver an IoT solution for bolt monitoring and a Cloud-based solution that can send maintenance reports to mining companies.

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MTG018-QuarrySenseX

Title:	4D quarry monitoring through multi sensors assessment		
Scheme	MINE-Demo		
Vertical sectors addressed	ICT		
Challenges tackled by SMEs	- Skilled workforce - Environmental footprint - Towards the digital world		
Start date	01/09/2021	**Duration**	52 weeks
Project partners	ARROW4D Consultores de Engenharia e Geofísica Lda, *Leader*, Provider, Portugal, ICT		
	LOCIS SIGTECH Soluciones Sostenibles SL, Provider, Spain, ICT		
	Antonio Galego & Filhos - Marmores SA, Adopter, Portugal, Raw Materials		

Abstract

It is intended with this project to apply in real context the powerful web platform, called INXSTONE, with the services that provide predictability data of the resource, combined with the deployment of an IoT network of sensors.

The use of all this data will allow monitoring several technical parameters in real time, and the optimization of human, equipment and geological resources, in order to minimize environmental impact, reduce waste production and costs, as well as improving the attractiveness of the profession, the communication between various departments, and the productivity and profitability of the company.

The INXSTONE platform allows 3D visualization and management of various technical parameters. The platform has been developed according to the web4.0 computing paradigm that allows viewing, editing, updating data in real time, and communication between the various operators. The information layers were developed in response to specific problems of the quarries, and that influence the economic value of the resource. The main attributes that value the resource are: block size, integrity and colour. These properties are estimated through aero-

photogrammetry that allows obtaining the 3D geometry as well as the colour. Applied geophysics allows estimating the fracture planes in the rock.

The study and understanding of environmental parameters and many of the processes improvements will be achieved through the implementation of the sensors network.

MTG019-OBIWAM

Title:	Ore Bodies Imaged With Atmospheric Muons		
Scheme	MINE-Demo		
Vertical sectors addressed	Mining and Raw Materials		
Challenges tackled by SMEs	- New innovation technologies - Towards the digital world		
Start date	01/09/2021	**Duration**	52 weeks
Project partners	Muon Solutions OY, *Leader*, Provider, Finland, Mining and Raw Materials		
	Saxore Bergbau GmbH, Adopter, Germany, Mining and Raw Materials		

Abstract

The highest metal grades are often in the form of high-density lenses or irregular ore bodies. The conventional geophysical methods used to identify such density anomalies include gravity and seismic waves-based methods. In this project, however, a dense ore body located near Freiberg, Germany, is imaged with a novel imaging method called muography.

The main difference between muography and conventional geophysical remote sensing methods is that it is not based on classical physics but the modern one and uses cosmic-ray induced muons to probe different materials. The muons are naturally generated in the upper atmosphere in the interactions between cosmic rays and air molecules. As high-energy particles, muons can travel through ores and surrounding rocks for many hundreds of metres, until stopped by energy loss caused by the material. The loss (attenuation) of muons is more severe the denser the rocks are.

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The used method is conceptually like the X-ray imaging of human body, although in this case the imaged object is drastically larger and completely solid. In the project, the dense ore deposit located in the licence area of the Saxore Bergbau GmbH in Germany is muographically imaged by the company Muon Solutions Oy from Finland. The imaging of the ore deposit of Saxore Bergbau GmbH provides exciting new prospects for mining and mineral exploration, as well as for many other new applications for the cosmic-ray based imaging.

MTG020-MOLECULE XRF

Title:	**Monitoring Of Low Elemental Contributions in Unclarified Liquids Employing XRF**		
Scheme	MINE-Demo		
Vertical sectors addressed	ICT		
Challenges tackled by SMEs	- Towards the digital world - New innovation technologies		
Start date	01/09/2021	**Duration**	52 weeks
Project partners	J&C Bachmann GmbH, *Leader*, Provider, Germany, ICT		
	Euratrade Solutions SAS, Adopter, France, Mining & Raw Materials		

Abstract

EURATRADE, a consulting and market expansion company for the mining industry has realized at their customers a huge potential to reduce costs by employing a 24/7 online system to monitor the elemental composition of slurries transported to tailings. Currently, these slurries are manually sampled and sent for laboratory analysis several times per day, which causes costs of ~4M €/year for a large mining company. By using an online measurement system, this expense could be greatly reduced. Replacing regular sampling with constant monitoring for process optimization would also result in a reduction of the amount of valuable raw materials to be discarded as tailings while simultaneously increasing the level of environmental control to guarantee a minimal content of noxious elements.

J&C Bachmann already has such a system in their product portfolio that adapts X-ray fluorescence to allow a continuous analysis of the elemental composition of a fluid stream. However, to guarantee the necessary high measurement accuracy, the system's measurement window needs to be prevented of getting clogged. Thus, the goal of this project is to integrate the XRF analyzer with a multiplexer system and use some of its inputs for preventive maintenance: artificial intelligence models will use control streams with a known elemental composition to realize if the measurement window is clogged and decide whether to start a dedicated cleaning stream or to adapt the analyzer's calibration.

MTG022-SmartMill

Title:	**Mine to mill optimization using extensive geo-metallurgical testing and advanced data analytics**		
Scheme	MINE-Demo		
Vertical sectors addressed	Mining		
Challenges tackled by SMEs	- Towards the digital world - New innovation technologies		
Start date	01/09/2021	**Duration**	52 weeks
Project partners	Geopyörä OY, Provider, Finland, Mining		
	Rovjok OY, Provider, Finland, Mining		
	UVR-FIA GmbH Verfahrensentwicklung Umweltschutztechnik Recycling, Adopter, Germany, Mining		

Abstract

This project aims to optimize a mining enterprise's value chain by using state-of-the-art comminution testing as input for cutting-edge business analytics and industrial artificial intelligence. The end goal is to increase the throughput in a critical mining operation bottleneck while simultaneously lowering costs.

Comminution tests are an important element in the design of ore beneficiation plants. Traditionally, test work has been conducted with a few representative reference samples used for the design. These limited test outputs increase the

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risk-profile during the project development phase – incurring high capital or operating cost to manage the high risk of the operating mine.

Geo-metallurgical modelling of the entire ore body populated with ore characterization data can explore the variability within the resource and establish spatial geo-metallurgical domains that show the differential response to mineral processing, therefore minimizing the risk profile of mining operations in the life-of-mine (LOM).

Integrating the ore characterization data with digital business analytics and mine-value-chain optimization tools provides an in-depth understanding of future performance of the mining operation. Comminution breakage data measured using the rapid ore characterization device, Geopyörä, is linked with the core mineralogy data in the Rovjok business analytics database to simulate optimize future performances of mining operations.

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THE CONSORTIUM

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