

FOR IMMEDIATE RELEASE

Contact: Asli Onar-Verboon

Phone: +31 6 3004 9576

E-mail: aov@eage.org

Date February 2019

Venue Neves-Corvo Copper and Zinc Mine (Portugal) & PDAC 2019 (Canada)

Website www.smartexploration.eu

Testing new technology and a new way of conducting exploration surveys in the Neves-Corvo Copper and Zinc Mine in Portugal at a 600 m level below surface, is a big milestone for the Smart Exploration Project funded by EU's Horizon 2020 programme. The outside-of-the-box thinking and the simultaneous exploration survey in the mine tunnels and surface level in a semi 3-D manner is a great leap forward for the European deep mines as well as worldwide.

The Smart Exploration Project, whose partners include Somincor a subsidiary of Lundin Mining who operates the Neves-Corvo mine, has seen success in the development of new technologies aimed at assisting mining operations in procuring a greater yield of raw materials while also drastically reducing environmental impacts. The latest development saw viable data acquired by using two new prototypes and utilizing mining infrastructures.

The new prototypes, Electric Shaker (developed by Seismic Mechatronics) and GPS time system (developed jointly by Uppsala University and Mic Nordic) were tested in real mine conditions, operating in exploration tunnels and mine as well as on the surface, over the course of two weeks. Somincor/Lundin Mining and LNEG facilitated the logistics of this first challenging field test of the technology. Video is available on our YouTube Channel: <https://youtu.be/ofRCGIne0b8>

Nelson Pacheco, Chief Mine Geologist of Somincor/Lundin Mining has been a lead advocate for using existing mining infrastructure, such as tunnels, for exploration and mine planning purposes, rather than only for drilling. He believes that "if we keep doing things in the same way over and over, we will not reach different results. We need to try new ways so that we can reach different and better results". These tests represent a step in that direction.

Simplistically, the seismic shakers are used to vibrate the ground and thus allowing to map the subsurface using echoes to create visuals, in a manner similar to ultrasound technologies, albeit a bit more complicated, as it was, like a pregnant woman. The new shaker is fully electric and broadband in frequency, making the images more accurate and higher resolution. This technique can be used, among other geophysical methods, to detect faults, dikes and in suitable conditions mineral deposits as well as guiding exploration programs.

SMART=EXPLORATION

new ways to explore the subsurface

The project also developed a new GPS synchronisation system and the project believes that this will be a breakthrough for seismic data acquisition in deep mines to allow utilizing mining infrastructures for exploration and mine planning.

The operation was not confined only to the mine tunnels. While the underground team was acquiring data at depth 600m in the exploration tunnels, the surface team was also harvesting data recorded from the shots generated by the shaker in the tunnels but rather in a peaceful condition. The latest tech to acquire data on the surface without a source on the surface is an evidence of project's innovative thinking. Sources were later generated on the surface while receivers in the tunnels were still utilized for data recording.

The successful testing of these new prototypes at Neves-Corvo in such set-up represents the latest achievement of the project and its state-of-art vision. "Through instrumenting mining infrastructures using an advanced synchronized in time array of ~1000 receivers (mixed 1C and 3C), Smart Exploration team will explore the down dip and the surrounding mining tunnels by populating seismic receivers synchronized in a manner similar to MRI scanning technology. This should allow resolving structures that often difficult to see using only surface seismic surveys providing also much higher resolution images than ever provided before." said Project's Coordinator Alireza Malehmir, Professor of Applied Geophysics at Uppsala University.

The Smart Exploration is an ambitious project funded by EU's Horizon 2020 Programme (project number 775971 with 5.2 million euros budget) that has started in December 2017. The Project involves 27 partners from research institutes, academics, SMEs, mining companies and civil society organisations, whose work together will bring 47 actionable deliverables in the mineral exploration field.

The project primarily focuses on developing cost-effective, environmentally-friendly tools and methods for geophysical exploration in highly challenging brownfield areas to meet the ever-increasing community (social acceptance) and environmental issues, as well as reduce the return time (from exploration to production).

At the same time, long-term greenfield exploration is essential and reducing exploration costs in these regions can have great consequences for development rates and a sustainable supply of raw materials at the same rate as whole world growth. Therefore, new innovative ideas are also tested for greenfield exploration to increase the potential of finding new major deposits of relevance to the EU.

The aim is to not only generate new technological and methodological markets for the EU, but to create results that will also allow for improved exploration in the EU countries and beyond.

SMART=EXPLORATION

new ways to explore the subsurface

Smart Exploration's partners include:

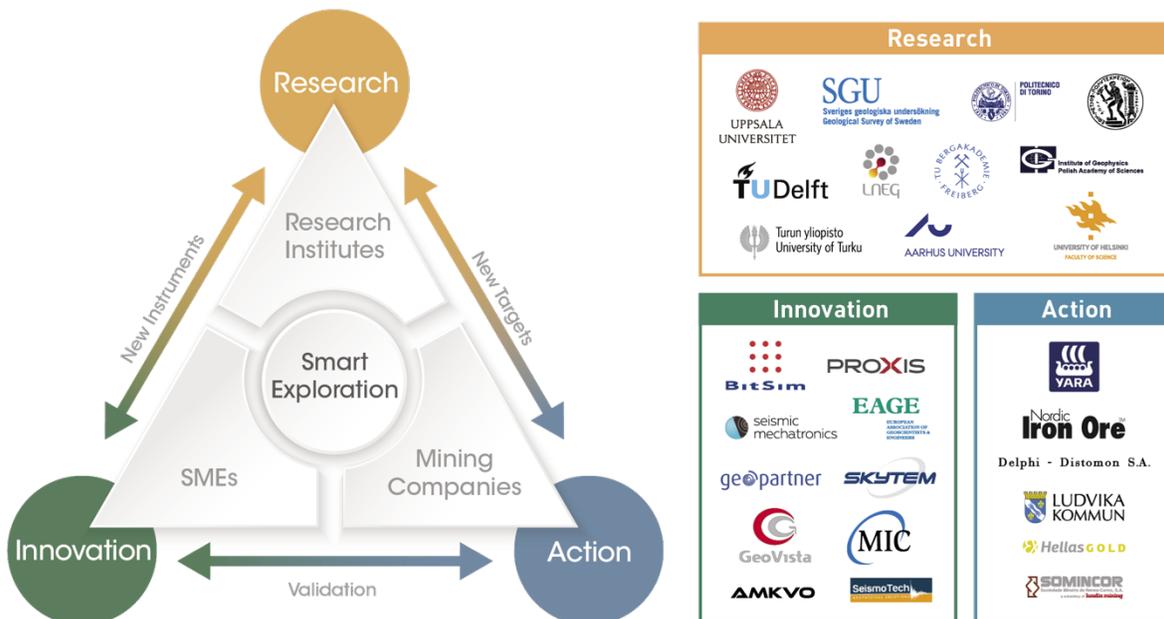
Stakeholders: Yara, Nordic Iron Ore, Delphi – Distomon, Ludvika Kommun, Somincor, Hellas Gold

SMEs: BitSim, Proxis, Seismic Mechatronics, Geopartner, EAGE, SKYTEM, GeoVista, MIC Nordic, AMKVO, Seismotech

Research Institutes: Uppsala University, Geological Survey of Sweden, Politecnico di Torino, National Technical University of Athens, LNEG, TU Bergakademie Freiberg, TU Delft, Institute of Geophysics, Polish Academy of Sciences, University of Helsinki, University of Turku, Aarhus University

The project has already been delivering very promising results, which wouldn't happen without the EU's funding. Neves-Corvo field activity has been one the validation sites and there are other validation sites in the project.

The Smart Exploration team is present at the PDAC 2019 Convention in Toronto during 2-6 March 2019. Learn more about the project, meet us at the EU's booth (#7009) at the North Hall and visit Project's social media channels on Twitter, LinkedIn, YouTube and Project's website www.smartexploration.eu.



Graphics representing the workflow of the Smart Exploration project and its partners