



# GOE 2

*An initiative to spark innovation in mineral resource extraction\**

Materials to support our way of life are extracted by mining and processing large quantities of rock containing minerals of interest. Once a source of minerals is found, the basic sequence by which extraction is done is:

**drill, blast, haul, dump, grind, separate, process the separated part, and discard the rest.**

While the sequence can be varied, the end goal is always the same: concentration of the target element(s) which results in discarding, and managing, a large part of what is mined. That has not changed since ancient times.

Several innovations have made the sequence safer, more efficient, automated, and even autonomous. Overlaying the physical steps involved in the sequence is a set of assumptions about resource ownership, governance, and even fundamental objectives.

It is tempting to think that further innovations will allow more efficient extraction with better environmental and social outcomes, but ...

**It is time to start re-thinking this paradigm.**

We need to implement research into methods to improve the detection, recovery and use of mineral resources and at the same time improve or mitigate environmental and social impacts. Such research needs thinking outside the box and to cross boundaries to include, but not be limited to, such areas as:

- Improving efficiency and productivity of assets
- Developing better extraction and recovery methods
- Making more use of the total resource

- Improvements to social, health, and environmental outcomes
- Governance and resource ownership mechanisms for communities
- etc.

**GOE 2** (pronounced GeoE2) will provide seed funding for any new idea that can contribute to a change in the paradigm.

**GOE 2** is organized as a competition in which university researchers, or perhaps industry researchers in collaboration with a university researcher, propose a potentially paradigm-changing idea to a panel, in writing and in a short presentation. The panel will then make a funding recommendation.

The funds are intended to encourage research into new ideas, or novel applications of old ideas. However, most importantly ...

**the scope is boundless and there are no dumb ideas.**

\*Why **GOE 2**? GOE stands for Great Oxygenation Event, a major increase in the oxygen levels of the Earth's atmosphere that occurred 2,500 million years ago. The additional oxygen was responsible for the evolution of more than 2,500 new minerals. There are now 4,400 minerals available in the earth, but the hope is that **GOE 2** can "breathe new life" into the minerals industry by changing its paradigm.

The picture at the top right is Mt Etna in Sicily which now blows 100 m diameter smoke rings due to a change in the shape of its vent. (Photo: Boris Behncke, Italian National Institute of Geophysics and Volcanology)