Additional Questions & Answers from the Europe and Africa session

Does prospective data shows the areas which are already mined or where there is potential of getting minerals ?

Typically these models highlight areas of untapped mineral potential. Often times mined areas are used as training data to build the model or to test the model during a validation stage. Model validation using deposits and mineral occurrences is also very helpful for picking the best model.

How do natural areas affect mineral potential?

Mineral potential is dependent on a large number of factors. sometimes geologists break these different factors into groups like drivers, sources, pathways, and traps. All of those different groups contribute to what is known as a mineral system. the presentation from GTK was a great example of how geophysics and geochemistry can be used to map the spatial distribution of these ore-forming processes.

How is the development of a European Battery Industry and e-car industry impacting resource development and mining in Europe? Any signs of exploration/development investments increasing? Any hope for "support packages" from EU level as post-Covid investments as part of the Green Deal?

Part of the issue here is around supply chains - for example, even if we start mining spodumene pegmatites in Europe, the processing will still need to take place in China. Europe would need to develop complete value chains to be able to supply the EV industry - and there are a lot of steps to be addressed.

A large part of CRM are identified outside Europe, what strategy should be followed to help these countries and especially Africa to identify these resources and exploit them to ensure the supply of Europe?

It's true, critical mineral lists have to find this balance between national interests and global forces. In Canada, we don't have a critical mineral list. But we are looking at other lists around the world and trying to see how our potential for natural resources fits within the global context.

Of course CRM, and battery minerals continue be in focus. However, it seems that the demand of other metals like Fe and Cu, is also growing. So maybe they are also the same important for more effective domestic exploration. What's your opinion?

Yes, these elements can be very important for the economic security of some countries. Canada is a major gold-producing country, but that element is absent on many critical mineral lists (except for Japan).

It's true, many of these metals are important for economic security. Canada is a major gold producing country, but that element is missing on many critical mineral lists.

One geology data presented by GTK, which can help in the discovery of critical minerals through knowledge sharing, do we know which countries are participating and what type of data is in the database?

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The One Geology is a great initiative, particularly given the importance of rock types in assessing mineral potential.

We have several databases in Europe as mentioned. What is missing is a harmonised database for the geochemistry of ores. Machine learning will not find critical minerals. What is needed is systematic mineral exploration in all European countries. Is there is such an initiative from Geological Surveys?

The multi-element chemistry of ore samples was also identified as missing by the USGS, GSC, and GA. We are trying to collect all of this information and release it freely as an online portal. It should be released this year. and we expect to add additional samples going forward. It's a tricky problem because many critical raw materials occur at very low concentrations in conventional ore samples.

There is, of course, an issue of funding. The EU has been excellent in funding collaboration in this area, but a lot of the projects have focused on drawing together the data. Moving towards process understanding and exploration targeting may be a next step that perhaps we can look at in Horizon Europe.

Which datasets have you found missing in your assessments? Which specific data collection do you expect to conduct in the coming years?

For Canada, geochemistry (isotope and lithogeochemistry) are really difficult to integrate into mineral assessments.

The problem is that these data are sparse and most of these datasets are still scattered within individual publications rather than a central database.

We need to do more to integrate environmental, social, and economic datasets into our assessments.

In Southern Africa, we know that Zimbabwe is one of the top 5 in Lithium resources in the world. The presentation in South Africa indicated a large occurrence of pegmatite in the Namaqualand, is South Africa planning to quantify its Li reserves in future in collaboration with the geological survey in the SADC region?

This sounds like an excellent idea and in fact we [BGS] are working with colleagues in Zimbabwe and would be delighted to discuss with CGS further on this. There is also potential for discussing Li beneficiation across SADC region. Taufeeq - would love to discuss this!