

The background of the slide is a close-up photograph of a natural rock surface. On the left side, there is a dense patch of bright green moss with small, star-shaped heads. The rest of the rock is dark grey and has a rough, textured appearance. A white curved shape is visible in the bottom left corner, likely part of a presentation slide.

Unified Information on Reserves and Resources in Support of National and European Raw Material Policies

November 15th, 2022 | Kimmo Tiilikainen
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Geological Survey of Finland Is an Expert in Geological Resources

Impartial and objective research information and services



CO₂

Climate change



Energy transition



Circular economy

Key figures

Founded in **1885**

300+ ongoing research projects

450 experts

250+ customers

100+ peer-reviewed scientific publications

71 % cooperation with GTK has led to new innovations, solutions, or practices*

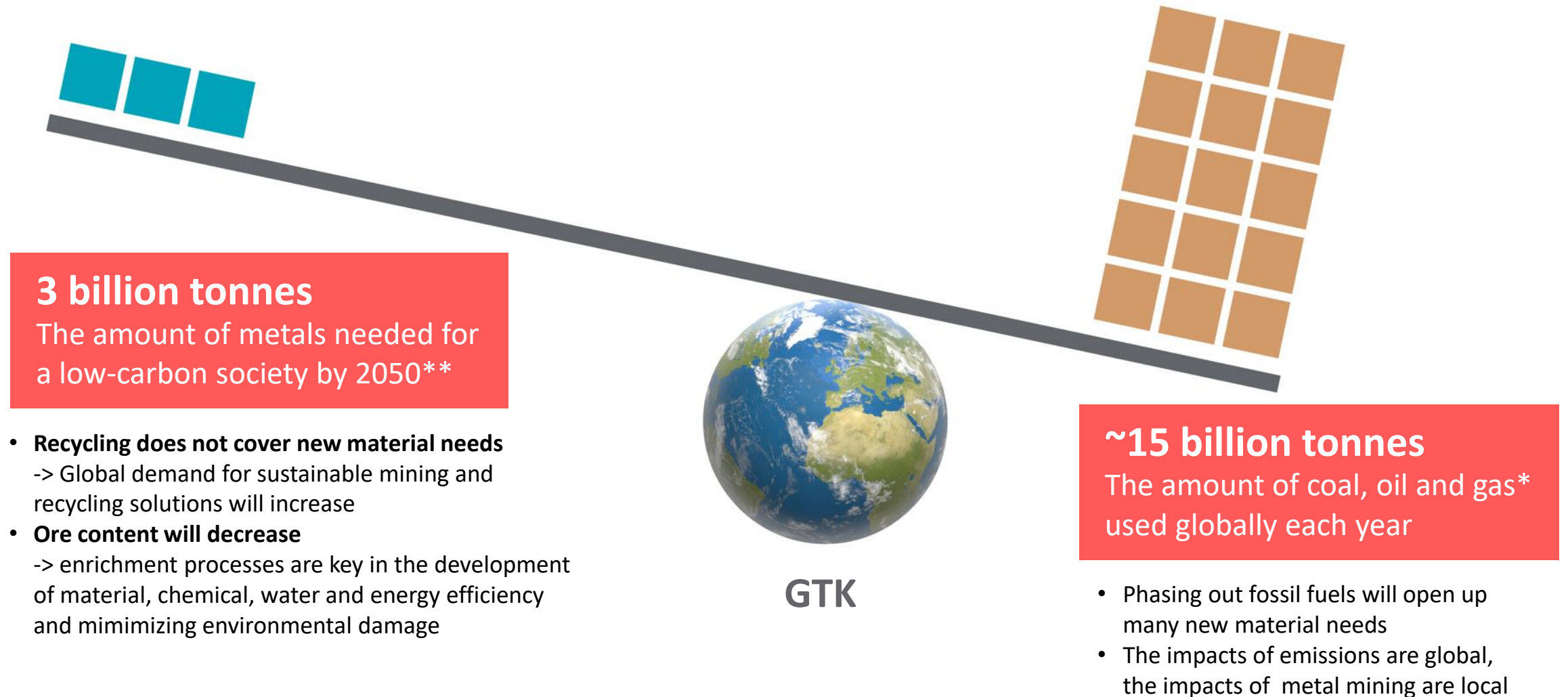
Research agency operating under the Ministry of Economic Affairs and Employment



international project activities on all continents

In **6** locations in Finland

Metals boost the low-carbon society



* Gas turned into tonnes of oil equivalent (TOE) in the calculation

The Beyond 2 Degrees Scenario (B2DS): **Aims to limit with a 50% chance global temperature rise to 1.75°C. above pre-industrial levels. (Hund, K., La Porta, D., Fabregas, T.P., Laing, T. & Drexhage, J. 2020.)

National Mineral Resources Accounting

Currently, there are no aggregated mineral resource figures from European countries classified according to the same classification system.

The benefits of having uniform resource figures

- Gives information on commercial and potentially commercial volumes
- Gives estimates of the resource potential for short to long-term accessibility to critical raw materials within the EU

This supports

- Critical raw material initiatives to classify projects and establish project inventories across Europe
- The goals of the European Green Deal
- The goals of the Critical Raw Materials Act

And reduces

- Raw material supply risks
- Effects of possible hostile acts by resources-exporter countries outside the EU

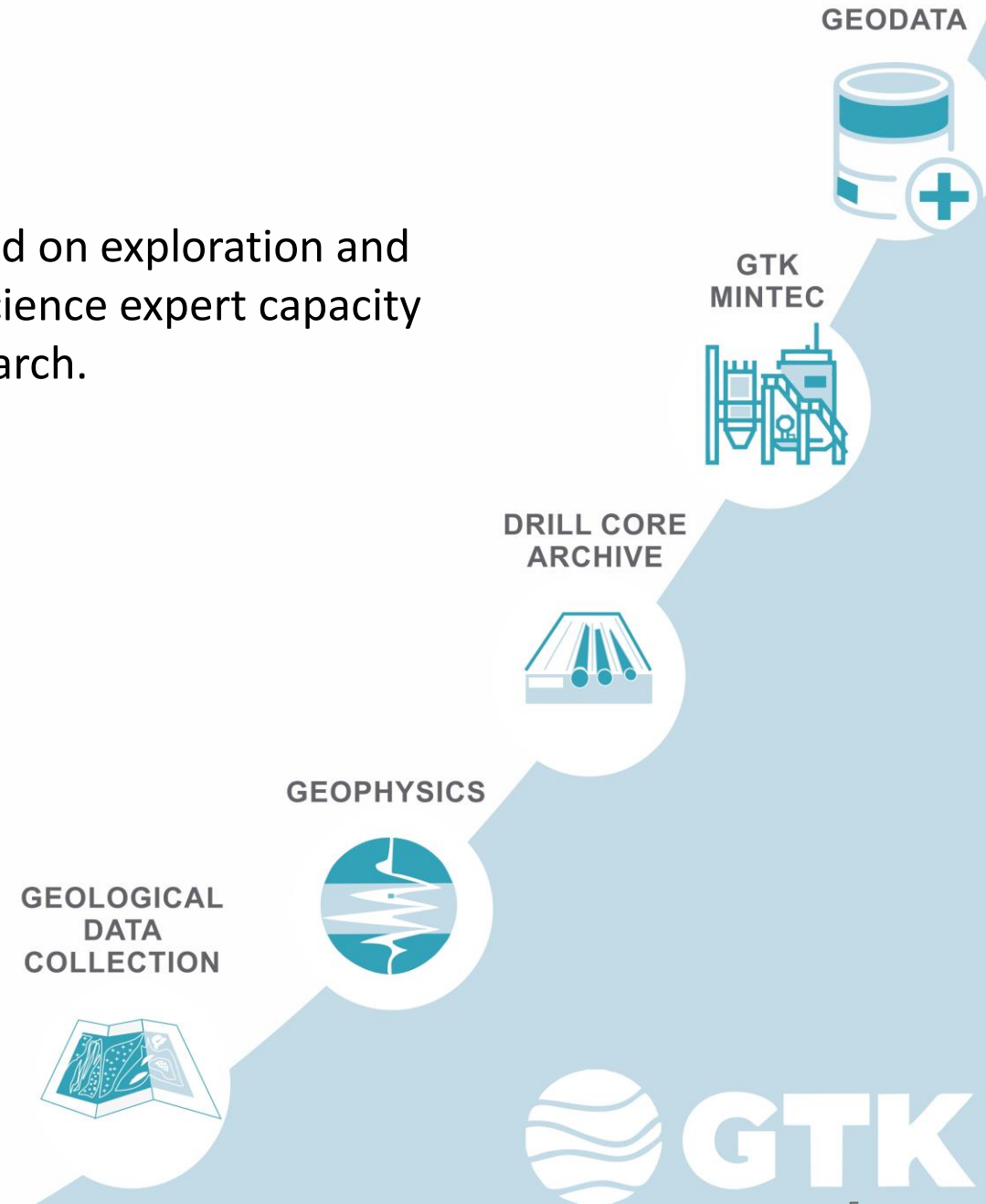
Sustainable Raw Materials Supply

The availability of the future mineral raw materials is based on exploration and research which require both major investments and geoscience expert capacity through industry–geosurvey–academia collaborative research.

In GTK, we believe that by providing:

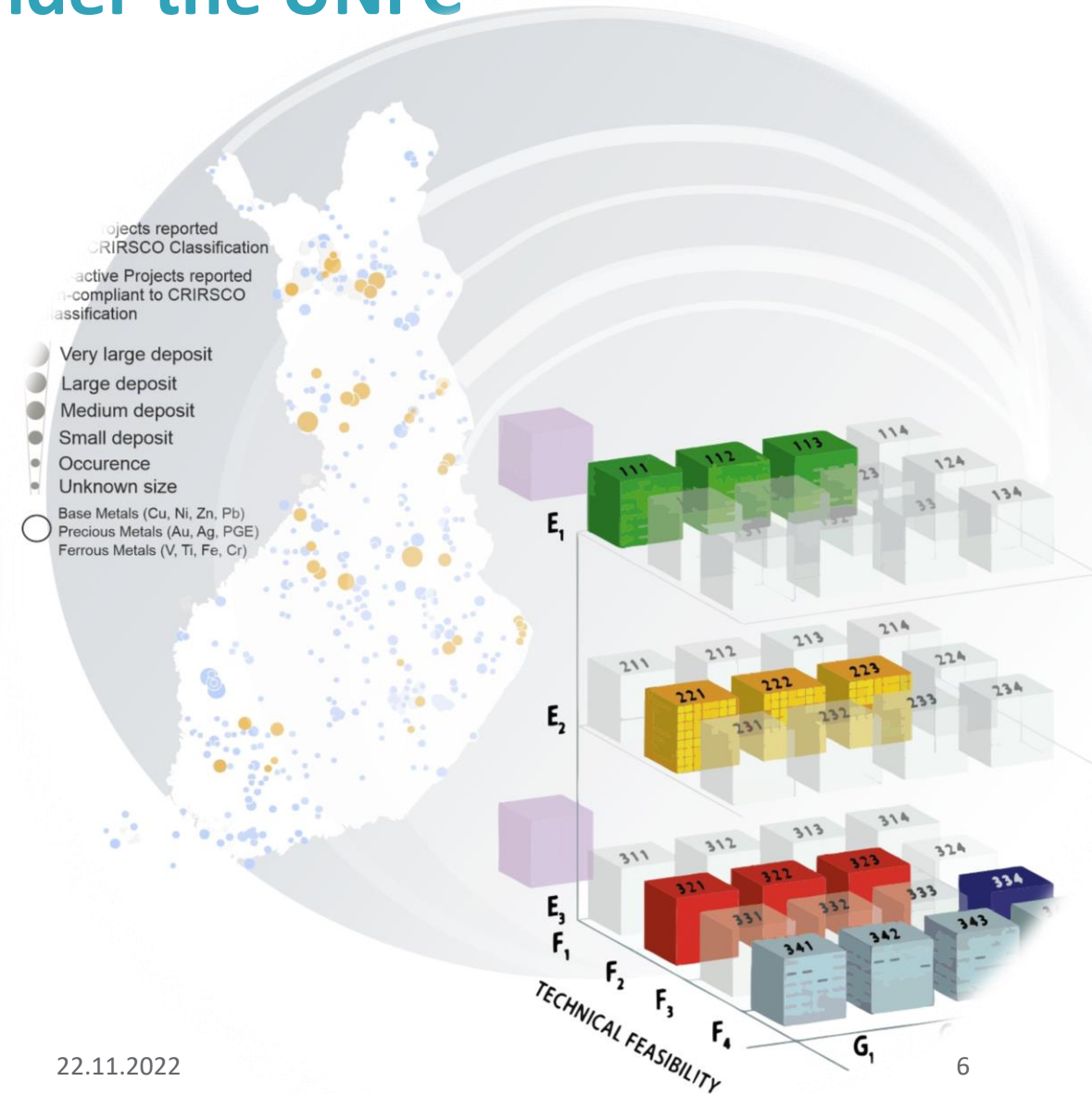
- *high-quality geological information on primary and secondary raw materials,*
- *harmonized information on resource quantities using the UNFC, and*
- *online access to geodata, enhance knowledge sharing and cooperation across Europe,*

we can serve both national and European resource management and support the European Green Deal.



Finland: National Aggregation Under the UNFC

- Finland allows entities to use any internationally recognised reporting system for the national reporting.
- The statutory reporting to mining authority is annual and concerns both exploration and mining companies that are active license holders.
- In 2020, GTK integrated the UNFC as part of its mineral deposit database structure and aggregated all mineral deposits under the UNFC.
- The task preceded training of key experts and publishing a guidance document on mapping the current and historical mineral inventories according to the UNFC guidelines.



Example: Cobalt resources in Finland

- Known resources 486 000 tons Co
- Additional assumed 108 000 tons Co ("undiscovered resources")

		UNFC class	~ tons cobalt
Potentially Viable	Viable	111	7 000
		112	6 000
		111+112	100 000
Potentially Viable	Viable	221	10 000
		222	38 000
		223	48 000
		221+222+223	177 000
Prospective	Viable	332	2 000
		333	2 000
		331+332+333	1 000
		334	40 000
		343	39 000
		344	16 000

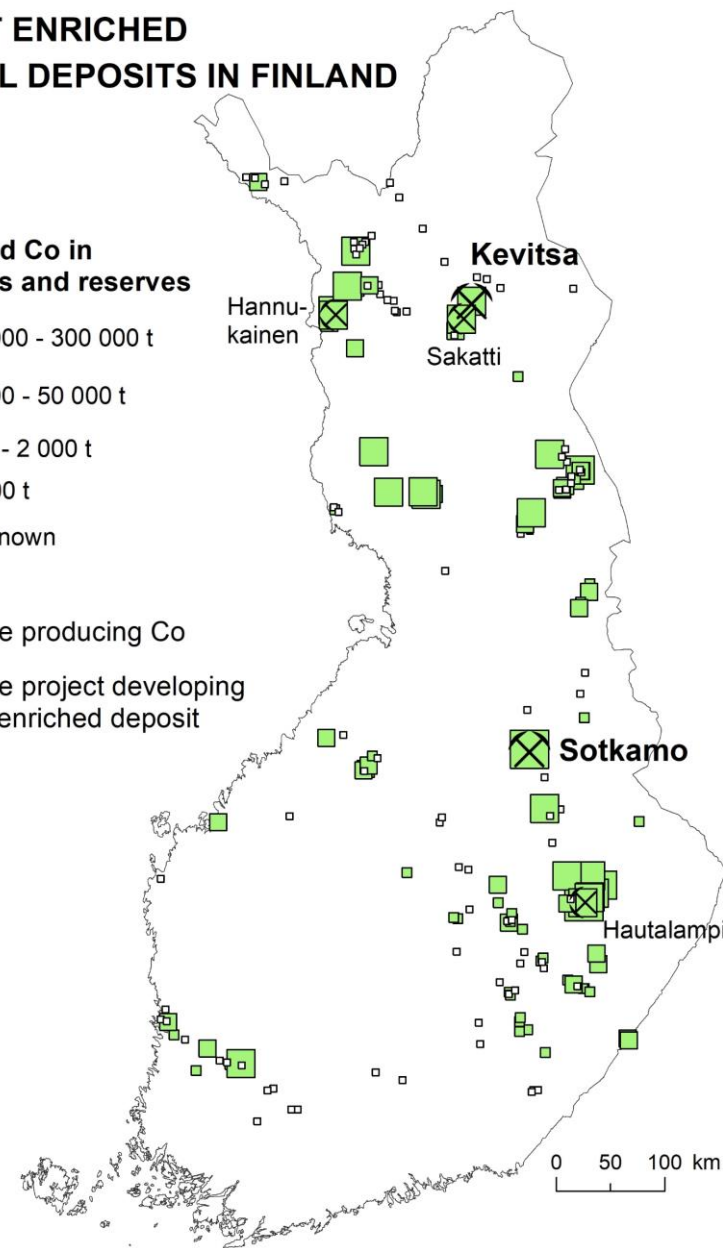
22.11.2022

COBALT ENRICHED MINERAL DEPOSITS IN FINLAND

Contained Co in resources and reserves

- 50 000 - 300 000 t
- 2 000 - 50 000 t
- 200 - 2 000 t
- < 200 t
- Unknown

- Mine producing Co
- Mine project developing Co enriched deposit



GTK Mintec

**Global Research and Innovation
Platform for Mineral processing and
Circular Economy**

GTK Mintec – Internationally Unique Pilot Plant and Research Environment for Mineral Processing

- Founded in the 1980's.
- Mineralogical research, bench-scale processing laboratory and Pilot Plant
- Processing solutions for primary minerals, geomaterials, tailings, slags and other secondary raw materials
- Pilot Plant contains crushing, grinding, beneficiation and tailings treatment as a continuous process
- Re-mining research of old tailings
- Long experience of battery-minerals processing (Li, Ni, Graphite, Co)



Conclusion

- GTK fully supports integrated sustainable resource management and foresees the benefits of using a single system (UNFC and UNRMS)
- To achieve this, Europe needs:



Systematic, centralized, data collection of raw materials information and national harmonization to UNFC.



Coherent and consistent classification of primary and secondary raw materials projects.



Operational network for monitoring and sharing critical raw materials information.



Cooperation and synergy across the entire European Union.

FOR EARTH AND FOR US

The Geological Survey of Finland (GTK) produces impartial and objective research data and services in support of decision-making in industry, academia, and wider society to accelerate the transition to a sustainable, carbon-neutral world. GTK employs more than 400 experts specializing in the mineral economy, circular economy, solutions related to energy, water and the environment, as well as digital solutions. GTK is a research institution governed by the Finnish Ministry of Employment and the Economy, operating in Finland and globally.
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