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Finland's Green Mining concept aims to promote sustainable and acceptable mining

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Mining has become increasingly difficult for societal and environmental reasons all over the world¹. There is increasing competition with other land uses, such as nature conservation, recreation, tourism, agriculture and infrastructural building. In many regions, there is also a scarcity of water and energy. People are not ready to radically reduce the use of mineral-based products, but increasingly oppose mining. The industry has major challenges to improve its performance and image.

Finland's Green Mining (GM) concept was developed as a major tool to make Finland the forerunner in sustainable mining. This concept is based on five pillars, as presented in Figure 1². GM promotes material, water and energy efficiency to reduce the environmental footprint of mineral-based product life cycles. GM allows the recovery of all useful minerals and minimises mining waste. GM aims to ensure the availability of mineral resources for future generations, which requires long-term investment in exploration supported by geoscientific mapping, mineral systems research and the development of exploration techniques. An important goal of GM is to minimise adverse environmental and social impacts in all the stages of the operations, and to maximise local benefits. GM helps to organise the operations in such a way that they are safe and meaningful to employees, and harmless for local residents and the environment. After mine closure, GM helps to restore the mining areas to make them safe and preferably to allow other types of land use. The broad-based participation of local residents and other stakeholders is crucial throughout the mining life cycle, from early exploration to mine closure.

The Finnish Funding Agency for Innovations (Tekes) operated a major GM programme (2011–2016) with the aim of making Finland's minerals cluster the world leader in intelligent and minimum impact mining. The programme included over 100 projects with a total budget of €116 million, and 185 partners from industry to academia. The results will help the mining industry to improve its performance in all areas of GM, and to make it economically, environmentally and socially more viable and acceptable in the future.

FINLAND'S GREEN MINING CONCEPT



Figure 1: Finland's Green Mining concept.

References:

- [1] Nurmi PA and Molnar F (2014) *European Geologist* 37(May): 12-19
- [2] Nurmi PA and Rasilainen K (2015) In: *Mineral Deposits of Finland*: Elsevier, 753-780

