Håvard Gautneb (Geological Survey of Norway) May 2023

Commodity	**Feldspar & Nepheline syenite**	**Data source**
Significance for the EU (2023)	*Critical, not strategic*	
Uses of the commodity	*Main uses:* *Glass, ceramic, sanitaryware and insulation* *Minor uses:* *Various types of fillers and extenders, dental material* *Future uses:* *Glass and fiberglass uses expected to increase, due to increase in automobile and solar panel glass industries. Anorthositic feldspar and Al raw material. CO_2-free white cement.*	Eynard et al (2020), USGS (2023)
Resources and potential in Nordic countries	*Estonia:* *None* *Finland:* *Known resources 910,000 t* *Greenland:* *21.8 Mt anorthosite inferred resource at Majoqqap Qaava;27 Mt indicated + 32 Mt inferred anorthosite resource at Qaqortorsuaq/White Mountain. Addition potential in anorthosites in SW Greenland and NW Greenland.* *Norway:* *Before WWII many hundreds of feldspar mines were in operation in Norway from pegmatites. Present endowment is unknown.* *Europe's biggest nepheline syenite mine has been in operation in N. Norway since 1960. Remaining resources are confidential.* *Sweden:* *Many quarries with historic feldspar production from granitic pegmatites. Present feldspar resources are unknown, but significant potential is assumed. The Norra Kärr deposit has an inferred resource of 110 Mt @ 65 % nepheline syenite. Further potential for nepheline syenite exists in some other alkaline rocks.*	National mineral occurrence databases: www.gtk.fi www.sgu.se www.ngu.no; Hudson Resources (2018), SRK Consulting (2021), Greenland Anorthosite Mining (2023) Rosa et al. (2023)
Anthropogenic resources and potential in Nordic countries	*Recycling of glass*	
Main deposit types in Nordic countries	*Pegmatites, nepheline syenite intrusions, and anorthosites*	
Main global deposit types	*Pegmatites, and nepheline syenites*	
Global production (2021)	*28 Mt (mines)*	USGS (2023)
Nordic production (2022)	*Finland 60,034 t; Greenland no data found; Norway 360,000 t; Sweden production figures are not available*	USGS (2023), Sibelco (pers.com)

Main producing countries (2022)	*India 22 %, Turkey 22 %, China 8.5 % Italy 7.8 % Iran 7.1 % (mining)*	USGS (2023)
Technological challenges in production	*Mostly, well-established, but energy-hungry technology. High-quality products must be low in iron.*	SCRREEN2 (2023), USGS (2023)
Recycling	*Present:* *Feldspars and nepheline syenite are recycled to a low degree. In most applications, the feldspar is destructed in production, so the mineral cannot be recycled. On the other hand, glass and ceramics have a high recycling rate.* *Future:* *Probably similar to the current recycling.*	SCRREEN2 (2023)

References

Eynard, U., Georgitzikis, K., Wittmer, D., Latunussa, C.E.L., Torres de Matos, C., Mancini, L., Unguru, M., Blagoeva, D., Bobba, S., Pavel, C., Carrara, S., Mathieux, F., Pennington, D. & Blengini, G.A. 2020. Study on the EU's list of Critical Raw Materials, Factsheets on Non-critical Raw Materials. 589 p. doi: 10.2873/587825; https://rmis.jrc.ec.europa.eu/uploads/CRM_2020_Factsheets_non-critical_Final.pdf

Greenland Anorthosite Mining 2023. Project Development. https://gam.gl/projects/project-development/

Hudson Resources 2018. White Mountain Anorthosite Project. https://hudsonresourcesinc.com/wp-content/uploads/2018/05/Hudson-May-2018.pptx.pdf

Rosa, D., Kalvig, P., Stendal, H. & Keiding, J.K. 2023. Review of critical raw material resource potential in Greenland. MiMa rapport 2023/1. 121 p. https://doi.org/10.22008/gpub/32049

SCRREEN2 2023. Feldspar fact sheet. https://scrreen.eu/wp-content/uploads/2023/03/SCRREEN2_factsheets_FELDSPAR.pdf

SRK Consulting 2021. Preliminary economic assessment of Norra Kärr rare earth deposit and potential by-products, Sweden. https://leadingedgematerials.com/wp-content/uploads/2021/08/NorraKarr_PEA_43-101.pdf

USGS 2023. Mineral commodity summaries 2023. U.S. Geological Survey. 210 p. https://pubs.usgs.gov/periodicals/mcs2023/mcs2023.pdf