Håvard Gautneb (Geological survey of Norway) 2023

Commodity	**Magnesium metal (Mg)**	**Data source**
Significance for the EU (2023)	*Critical and Strategic*	
Uses of the commodity	Main uses: *Automotive, packaging* Minor uses: *Construction Aeronautical* Future uses: *Magnesium metal is an important alloying component for aluminium and the need for Mg-metal is assumed to be linked to production of aluminium*	Latunussa et al. (2020)
Resources and potential in Nordic countries	*All the Nordic countries, including Estonia, have large and unquantified resources of dolomite. Aggregated resources are by all probability in order of several billion tonne. However, there is a strict quality demand for dolomite used for Mg metal production, and actual Mg metal potential from dolomite cannot be assessed at present. Magnesite is another potential source for Mg. The known magnesite resources in Finland are 3.6 Mt, whereas there probably are >100 Mt magnesite in the Finnish soapstones. Olivine-rich rocks are potentially resources for Mg metal. The resources of dunitic rocks are also very large in all Nordic countries except Estonia.* *Norsk Hydro had a magnesium plant in operation in Porsgrunn, Norway, from the early 1950s until 2001. Since 2007, there has been no magnesium metal production anywhere in Europe.*	
Anthropogenic resources and potential in Nordic countries	*Automotive and industrial scrap.*	Latunussa et al. (2020)
Main deposit types in Nordic countries	*Dolomite, dunite, and magnesite deposits*	
Main global deposit types	*Magnesite, dolomite, carnallite, kainite, polyhalite, serpentinite and dunite.*	
Global production (2022)	*Mine production for Mg cannot be estimated since dolomite and magnesite are used for many different applications, and in much larger volumes than for making Mg metal. Magnesium metal production was 1,000,000 t (smelters).*	USGS (2023)
Nordic production (2022)	*No production.*	
Main producing countries (2022)	*China 90 %, Russia 5 %, Brazil 2 %, Israel 2 % (smelter production)*	USGS (2023)
Technological challenges in production	*The present production of Mg metal is based the reaction between ferrosilicon and dolomite and*	

	magnesite (Pidgeon process), producing 28 kg of CO_2 emission and a large amount waste material.	
Recycling	Present: *Recycling is estimated to be about 13 %, mainly from automotive scrap metal.* Future: *EoL recycyling assumed to increase.*	Latunussa et al. (2020)

References

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