

Peer Review Report

Review Report on European raw materials resilience – turning a blind eye

Perspective, Earth Sci. Syst. Soc.

Reviewer: Ewa Lewicka

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EVALUATION

Q 1 Please summarize the findings and viewpoint reported.

The article deals with important issues of securing raw materials availability for high-tech and green technologies in Europe in view of its dependence on foreign suppliers and limited prospects for mining development. European production covers only a small fraction of domestic demand. Shortage of some metals is likely to worsen due to recent sanctions against Russia and rapidly growing demand from technologies required in transition to low-carbon society. According to the Authors mining in Europe needs promoting and strong backing from European and national agencies in order to improve its public image and develop the raw materials sustainable production from domestic sources. Another important aspect is to reduce sourcing of raw materials from remote regions where European environmental and societal rules are not respected.

Q 2 Please highlight the limitations and strengths.

LIMITATIONS: In my opinion some problems have been dealt with too briefly and can be discussed more in-depth.

STRENGTHS: The article attempts to increase the public awareness of the significance of the mining, which nowadays can be done sustainably, and the security of minerals supply for the society and economy. Very convincing is the comparison of impact of mining to that of fishing and farming, which are seen as “greener”. Another important issue underlined is that – if the European climate goals are achieved – the vast resources of raw materials will be required, while the security of their supply has not been assured.

Q 3 Please comment on the reported results and data interpretation. If there are any objective errors or fundamental flaws, you should please detail your concerns.

Lines 24–25: “The war in Ukraine and sanctions against Russia have brought to the fore the issue of supply security and Europe’s alarmingly limited raw materials resilience”.

The issue of Europe’s minerals’ security and dependency on foreign supplies had been brought much earlier than the war in Ukraine broke out. This has been discussed in Europe since the early 2000s. In the past, there were reinforced concerns related to disruption of some raw materials supply, e.g., REEs from China and cobalt from the DRC. As a result, in 2011 the first list of critical raw materials for the European Union was prepared. Since then it has been published every three years. In the UK, the current list of minerals (elements) was compiled by the British Geological Survey as the so-called “Risk List” 2015. Maybe these issues should also be mentioned here?

Lines 42–43: “...the supply of raw materials received very little attention”.

I would suggest to say “relatively little attention” instead of “very little attention”. There are many publications and reports on the issue of Europe’s and global dependency on foreign supplies both before and as a result of Covid-19 pandemic.

Lines 44–45: “On 8 March, President Putin signed an order to prohibit the import and export of critical raw materials”.

I would not say that the order has been related to critical raw materials. The ban (valid until the end of 2022) referred mostly to certain goods (devices and equipment) and to some kind of wood. As far as I know, nickel, palladium and other metals have not been prohibited from being exported from Russia. Nevertheless, this probability cannot be excluded and certainly “disruption of supplies of these metals, or an increase in their

prices caused by global shortages, would have a significant negative impact on European industry and on the global economy”.

Line 60: “... many European governments have taken measures to oppose rather than promote mining”. I would recommend to explain what were the reasons for that as well as quote some more examples of opposition against mining in European countries (e.g. Mina do Barroso in Portugal developed by Savannah Resources based in London, and others, e.g. in Spain, Sweden, and Norway).

Lines 83–86: “...there is little discussion of the vast resources of raw materials that will be consumed when implementing these technologies. The focus on green approaches too often neglects both the security of supply of raw materials and the conditions under which these resources are obtained”.

In my opinion it is not so bad. There is ongoing discussion on this matter as well as publications and reports, including, e.g., Metals for Clean Energy: Pathways to solving Europe’s raw materials challenge – Report 2022 by KU Leuven for Eurometaux; Mines, Minerals, and “Green” Energy: A reality Check – Report 2020 by Mark P. Mills; European Commission, EIP on Raw Materials, Raw Materials Scoreboard 2018.

MINOR REMARKS

Line 22: “Each European consumes more than 25 tonnes of metals and mineral products per year” – please quote the reference.

Lines 68–69: “Poland has one of the strongest mining sectors in Europe, but mining and quarrying contribute only about 1% of the country’s GDP” – please quote the reference.

Q 4 Check List

Is the English language of sufficient quality?

Yes.

Is the quality of the figures and tables satisfactory?

Yes.

Does the reference list cover the relevant literature adequately and in an unbiased manner?

Yes.

If the manuscript includes original data, are the applied methods accurate and comprehensively described?

Not Applicable.

Are the statistical methods valid and correctly applied? (e.g. sample size, choice of test)

Not Applicable.

Are the data underlying the study available in either the article, supplement, or deposited in a repository?

Yes.

Does the study adhere to ethical standards including ethics committee approval and consent procedure?

Not Applicable.

Q 5 Please provide your detailed review report to the editor and authors (including any comments on the Q4 Check List):

The article deals with important issues of securing raw materials availability for high-tech and green technologies in Europe in view of its dependence on foreign suppliers and limited prospects for mining development. European production covers only a small fraction of domestic demand. The major threat facing the global environment is climate change, and to meet this threat, mining will need to play a major role. Shortage of some metals is likely to worsen due to sanctions against Russia and rapidly growing demand in technologies required in transition to low-carbon society. According to the authors mining in Europe needs

promoting and strong backing from European and national agencies in order to improve its public image and develop the raw materials sustainable production from domestic sources. Another important aspect is to reduce sourcing of raw materials from remote regions where European environmental and societal rules are not respected.

QUALITY ASSESSMENT

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|---|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Q 6 ▶ Originality | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Q 7 ▶ Rigor | <input checked="" type="checkbox"/> |
| Q 8 ▶ Significance to the field | <input checked="" type="checkbox"/> |
| Q 9 ▶ Interest to a general audience | <input checked="" type="checkbox"/> |
| Q 10 ▶ Quality of the writing | <input checked="" type="checkbox"/> |
| Q 11 ▶ Overall quality of the study | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |