

DOI: <http://doi.org/10.21698/simi.2022.ab21>

CIRCULAR ECONOMY AND CRITICALITY OF RAW MATERIALS

Caner Zambak^{1,2}

¹Miners Association of Turkey, Environmental Coordinator, canerzambak@gmail.com, Turkey

²Balkan Environmental Association (B.EN.A), Vice President-ex

Keywords: *Circular economy, Critical / Strategic raw materials, Economic growth, Supply risk*

Synopsis

Throughout history, communities have obtained their vital primary raw materials from natural resources, and this is the case today and will continue in the future. In addition to basic needs such as food and shelter, the need for primary mineral raw materials increases rapidly in terms of quantity and diversity. Today, while developing countries are facing difficulties in accessing to the technologies and raw materials used in the manufacturing industries, the developed countries, in their effort to strengthen and further grow their economies, are also facing major supply risks for mineral raw materials that are not available domestically. As clearly stated in policy documents, securing raw materials supply is a major concern for the EU's economic growth policies and programs, such as "Green Deal", "Net-Zero" and "Circular Economy".

When the magnitude/importance of the economic significance to the country is evaluated together with the anticipated supply risk factor, raw materials that are of high-priority are called as "Critical Raw Materials" and of those which are predicted/foreseen to endanger the country's economic and defense security are called "Strategic Raw Materials".

As being relative concepts and are subject to questions, like "*for who, to whom, when and for how long*", the critical/strategic raw material lists of the countries show variations and updated periodically. As in the case for EU, the number of items in the EU Critical Raw Materials list grew from 14 to 30 in the 2011-2020 period and will likely grow further under current global geopolitical unrest. So far, official declaration of Strategic Raw Material Lists is not openly declared by the countries; with exception being China (*declared a "Protected and Critical Raw Materials List", in 2016*).

Increasing supply risk problems for minerals and materials needed in solar/wind energy and energy storage technologies, which are vitally necessary within the context of combating global climate change, have become a strategic issue due to their importance in terms of geo-economic rivalries.

In the process of these developments, the USA, EU, Japan, South Korea, UK and Canada have been working on periodically updated "Critical Raw Material Lists" since 2010, which are likely to impede their economic growth in case of not being able to sufficiently supply them.

In order to reduce the "Supply Risk", which is the most important factor in criticality of raw materials, the applicable supply management strategies are as follows:

- to increase domestic mineral resource exploration and extraction (*mining*),
- to reduce supply risk by establishing strategic cooperation with countries with rich raw material resources and to establish cooperation with critical raw material producers, traders and associations,
- to increase the critical raw material recovery potential from wastes (*waste recovery*) and research on the use of substitutes within the context of Circular Economy, and
- increase national inventory stocks of critical raw materials.

In this presentation, current developments in geo-politics of non-fuel "Critical/Strategic Raw Materials" and applicable resource management strategies with emphasis on mining and waste recovery will be discussed along with environmental aspects.