

INTELLIGENCE BULLETIN #3

Strategic Intelligence Bulletins aim to enrich strategic and managerial decisions and to engage stakeholders based on partners networks.

RAW MATERIALS SUPPLY CRISIS

Our lives would be dramatically different without secure access to raw materials. For example, the platinum group metals (PGMs) – among the least abundant of the Earth's elements – are found in the touchpads of mobile devices, flat screen televisions, automobiles, jet engines and pacemakers, to name only a few. Even a device as common as a smart phone can require more than 50 different metals, including silicon, rare earth elements, and lithium that are in huge demand with limited supply. This makes raw materials crucial to Europe's recovery and essential to maintaining and improving our quality of life.

CAUSES

European business is unfavourably impacted due to difficulties in procuring raw materials, mainly from China due to Chinese dual energy policy (China's "dual-control" implementation: A tight balancing act amid the energy transition. "Dual control" to reduce energy intensity and to limit total energy consumption is a key measure that the Chinese government implements to help meet its energy and climate goals) and increased procurement prices for almost all items due to interruptions in supply of materials and increased logistics costs arising out of vessel shortage and port congestion in various part of the world.

PROSPECTS

Demand is skyrocketing, with many of these resources essential for technologies and sectors that will underpin the drive toward climate neutrality. The Organisation for Economic Co-operation and development (OECD) estimates global materials demand will more than double by 2060, reaching a staggering 167 billion tonnes. For instance, electric vehicles and energy storage solutions require minerals like graphite, lithium and cobalt, potentially increasing demand by nearly 500% by 2050.

PERMANENT MAGNETS

Meanwhile our dependence on rare earth element permanent magnets for use in space exploration, guidance systems, communications, power generation, and healthcare is driving an exponentially increasing need for rare earth elements (REEs). Not only are most of the CRMs, including between 75% and 100% of metals, obtained primarily from countries outside the EU, but they are often sourced from a few mines in one or two countries. China is a leading supplier overall, meeting about 66% of global demand for the CRMs identified in the 2020 list including more than 80% of global demand for REEs¹. Achieving Europe's

¹ <https://horizon.scienceblog.com/1873/europe-is-finding-its-hidden-treasures-to-build-its-green-digital-and-climate-neutral-economy/>

goal of a green, digital economy and climate neutrality by 2050 means we need to boost capacity in green mining, processing, production, reuse, recycling and substitution.

Neodymium is the strongest permanent magnet material yet discovered. It is widely used in microphones, professional loudspeakers, headphones, computer hard disks, electric motors and generators. It is a rare-earth mineral mostly extracted in China, the United States, Brazil, India, Sri Lanka, and Australia. Figure 1 below shows the historical prices for Neodymium for the last 6 years. The price picked up in Feb 2022. Overall, global rare earth supply growth is significantly higher than neodymium magnet consumption growth. In addition, the supply channels of rare earths are becoming more diverse and stable.

Rare earth prices have plunged sharply since March after hitting their highest in nearly a decade in February. Typically, PrNd metal price continued to drop by around 16% in March. Following this trend, it is predicted that PrNd metal price will drop in 2022 until getting a stable trading rate that different models predict between 800000 and 1000000 CNY/T at the end of the year.



source: tradingeconomics.com

Figure 1. Neodymium prices in CNY/T over the last 6 years²

The global competition for raw materials is ramping up quickly and Europe is strengthening its links all along the raw materials' value chain. Diversification of raw materials for permanent magnets, such as PASSENGER project, is becoming even more important due to the current crisis, prices and supply risks raising.

WHAT THE EC IS DOING ABOUT IT

Create the European Raw Materials Alliance

² <https://tradingeconomics.com/commodity/neodymium>

*Invest in R&D for circular economy**Better usage of domestic resources and engage with third countries*

The looming threat of supply insecurity is not something new to the European Commission (EC), which has been expanding efforts to meet the challenge for more than a decade. The EC launched the Raw Materials Initiative in 2008, aimed at diversifying supply sources to minimise disruptions if one link “breaks”. One of its first activities was to establish a list of [critical raw materials](#) (CRMs). CRMs are defined as those materials that are economically and strategically important for the European economy, have a substantial risk associated with their supply, and are difficult to substitute due to their unique properties. The first list of 14 CRMs was published in 2011 and it has been revised every three years since then.

The [2020 list](#) contains [30 CRMs](#), including newcomer strontium, which was not even considered in 2017. Strontium-90 is one of the best high-energy-beta emitters. Betavoltaic systems, a promising alternative to current battery technologies, are self-contained power sources that convert high-energy beta particles emitted from the decay of radioactive isotopes into electrical current. They could be used to generate electricity for space vehicles or remote weather stations and navigational beacons.

It is relatively straightforward to understand why some materials are strategically and economically important. The most obvious solution to CRM security is to produce more of these materials and that means both extracting from mines and processing – two highly interdependent activities. Extracting more raw materials is the first step in a long value chain, and processing is the second. Europe not only imports CRMs but often imports them after they’ve been processed as well as importing important products that contain them. For example, China currently produces [more than 90% of rare earth magnets, which are used in nearly all electric vehicles](#).

‘To have a secure supply chain, we need enhanced exploration and new deposits, but we also need processing, metal making and magnet production,’ said Wall. ‘The European Raw Materials Alliance is working on developing the other links in the chain. We need investment in all these stages and incentives to link those together.’

According to Wall, some materials like REEs will always have a global supply chain due to where these deposits are found in the Earth’s crust, but Europe can increase its presence beyond its borders by, for example, partnering in mine development and operation. However, the later steps of processing should really be in Europe to remove dependence on China, she added. Other countries including Australia, Malaysia, and the US are rapidly expanding processing capability, and we should too.

Tackling the gaps and paving the way to a secure raw materials value chain to meet future demand requires a multidisciplinary effort. [SCREEN2](#) project is collecting and analysing data on CRMs and updating factsheets regularly while analysing the future supply and demand of raw materials, policy and technology gaps and innovation potential along the raw materials value chains to support targeted and effective EC policymaking.

Criticality of raw materials can alter relatively quickly as supply and/or demand change due to anything from geopolitical tensions to the development of innovative technologies and applications. For this reason, the European Union decided to include CRMs and non-CRMs in more frequent updates of materials factsheets and foresight reports on the future of target sector value chains.

RUSSIA'S WAR AGAINST UKRAINE: HOW WILL IT IMPACT EU'S SECURITY OF SUPPLY?

Following Russia's military aggression of Ukraine, the uncertainty in international commodity markets of non-food, non-energy (NFNE) raw materials has ramped up with significant and immediate implications in the EU and worldwide. The Raw materials information system (RMIS) from the Joint research centre (JRC) has released a special edition newsletter on this matter. Key materials to be most affected are Potash and Titanium. Their conclusions are that Among the major threats for the EU's security of supply and EU's economy can be identified:

- The sanctions affecting the financing of the Russian mining and metal industry and its ability to import raw materials or export finished products will likely disrupt the global and EU supply chains.
- The targeted export/import restrictions of specific raw materials in the context of additional sanctions from the EU or/and countermeasures from Russia.
- The commodity price increase due to restricted supply and high energy prices, and the disruption of EU exports to the countries involved in Ukraine-Russia war.



Download the full Newsletter here: [RMIS Newsletter special edition: focus on the Russo-Ukrainian war](#)

Additional analyses can be found in the [Material Specific Briefs page](#)