Resource Scarcity — A Ticking Time Bomb

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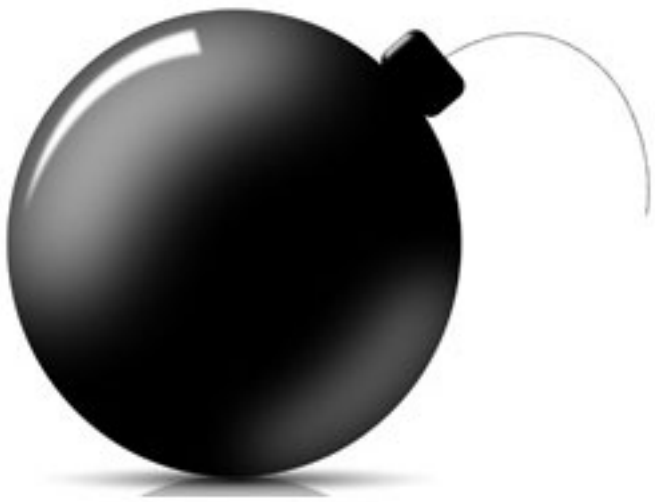


Executives of leading global manufacturing companies believe that the impact of minerals and metals scarcity will increase strongly in the next five years. However, there are large variations in the likely impact on different sectors and regions, and their state of preparedness. Economic and political dimensions are generally more important than the physical dimension of scarcity. Collaboration within the supply chain and new business models will be fundamental to the ability to respond appropriately to the risks and opportunities posed by the scarcity of minerals and metals.

1. Major manufacturing companies consider minerals and metals scarcity as an important issue for their business, but do not see sufficient awareness of this topic among all their stakeholders. In all of the sectors covered by our survey, and in all regions, business seems to be aware of the issue of scarcity, but the importance of the four natural resources varies, with minerals and metals scarcity (77 percent) and energy scarcity (75 percent) being high on the agendas of top executives, while water (57 percent) and land (35 percent) are perceived as less scarce. In addition, these executives perceive the level of awareness of stakeholder groups, customers and employees to be comparatively low.

2. The risk of scarcity is expected to rise significantly, leading to supply instability and potential disruptions in the next five years, but this also creates opportunities for competitive advantage. Risk arising from minerals and metals scarcity is expected to increase across all industries in the next

five years. The survey showed that renewable energy (78 percent), automotive (64 percent), and energy and utilities (57 percent) are currently experiencing instability of supply. Especially aviation, high tech and infrastructure believe to see a high rise of instability of supply from now to 2016. While companies in Europe believe that there will be a high risk in the future, primarily due to an instability of supply, they also see the issue as an opportunity. European companies seem to feel better prepared, with policies and programs to mitigate risk. Examples of particular opportunities suggested by the respondents included the backward integration of operations, exploring new technology and substitutes, and prospecting for new mineral reserves.

3. Because of the crucial nature of these minerals and metals, companies expect that the impact will be felt throughout the entire supply chain. The impact of minerals and metals scarcity tends to increase as you move down the supply chain, but it may also cause stress all along the supply chain. For example, 89 percent of renewable energy respondents expect that their suppliers will be impacted. Even though the current direct financial costs are relatively low, the risk of instability of supply is high because of the crucial nature of minerals and metals in production (from “just in time” to “just not there”). Although some Asia Pacific countries, especially China, have abundant reserves of scarce minerals and metals, the expected impact of scarcity on companies in these countries over the next five years is still substantial (53 percent). The percentage of companies that expect to be affected by this scarcity will triple in the chemicals industry, whilst it will double in the renewable-energy and high-tech sectors.

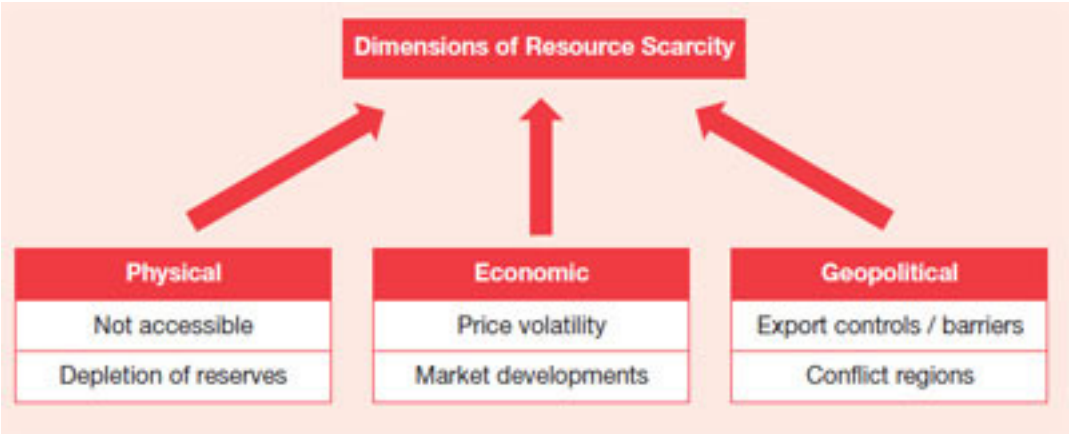
4. Economic and political drivers of scarcity are generally seen as much more important than physical drivers. The most important drivers overall are growing demand (65 percent) and geo-politics (54 percent). The exhaustion of reserves rates less highly (30 percent). Low substitution is named as a very important driver for the renewable energy (89 percent), energy and utilities (79 percent), and chemical industries (78 percent). Given the range of factors that contribute to resource scarcity, it is clear that all stakeholders in the supply chain need to be involved in addressing this issue. Mining companies have a key role in identifying and developing new reserves and managing existing reserves, governments should remove trade barriers, universities and research institutions should accelerate research and development, companies should invest more in innovations for substitution and resource efficiency, and consumers need to take responsibility by recycling waste materials.

5. The renewable energy, automotive and high-tech industries have a high level of cooperation with their first-tier suppliers and customers. The survey results indicate that a majority of 73 percent feel that they are sufficiently prepared. Companies in Europe are highly prepared in terms of policies and programs to mitigate the potential impact of scarce minerals and metals, followed by the Americas and Asia Pacific. At present, the renewable energy (67 percent) and automotive (64 percent) industries are better prepared

than the aviation (50 percent), high-tech and chemical industries (both 33 percent), which demonstrate a relatively low level of preparedness. In contrast to industrial organizations and suppliers, the respondents perceive non-governmental organizations, customers and employees as being much less prepared to tackle the issue. The automotive and high-tech industries show the highest degree of collaboration with first-tier suppliers and customers to reduce the impact of scarcity on their companies, compared to the aviation and chemical sectors.

6. For a large majority of the companies we interviewed, efficiency and collaboration throughout the supply chain are seen as essential to responding to the risk. Resource efficiency is seen as the single most effective response to address resource scarcity (75 percent). However, strategic alliances with suppliers (68 percent), supplier diversification (67 percent), more research and development (65 percent), more re-use (64 percent) and more geo-diplomacy (61 percent) all rate highly. More extraction (55 percent) and relocating production (42 percent) scored less strongly, perhaps indicating that the physical dimension of scarcity is seen as relatively less important. In Europe, end-users are seen as a relevant party because of the possibility of re-using minerals and metals (92 percent). Respondents in the Americas and Asia Pacific perceive re-use as a less applicable response, but are instead more focused on resource efficiency. Data information, recycling technology, substitution technology and regulation are all considered as required elements of any response to the issue of minerals and metals scarcity.

Dimensions of Scarcity



Scarcity can be divided into three dimensions: physical (just not there), economic (volatile or increasing prices) and geo-political (political barriers). For renewable resources, the economic dimension is typically the main driver. But what about non-renewables, such as minerals and metals?

Captured in our earth’s crust and concentrated in only a few regions, minerals and metals are relatively difficult and expensive to extract. The process is capital-intensive, not only financially, but also in terms of energy consumption, land use

and water extraction — so the environmental and social impact is of growing concern.

The supply of many minerals and metals is struggling to keep up with rapid increases in consumption, resulting in price hikes and delivery delays. For example, dysprosium, an essential component of super magnets, and tantalum, an important component in aircraft and medical equipment, automotive electronics, mobile phones and LCD screens, have both experienced explosive price increases in recent years.

Resource scarcity is becoming a central issue on the policy agenda for many countries. The European Union is pushing for resource efficiency and trade policies that favor international open markets. In the U.S., the Dodd Frank Act is forcing companies to become transparent with respect to the use of conflict minerals.

Meanwhile, the producing countries are starting to protect their interests with export taxes and trade restrictions, particularly for metals and minerals with high innovative value. China, for example, has imposed trade barriers for some metals to protect its domestic industries. These developments are adding to the concerns of international manufacturers regarding costs and security of supply.

10 Questions to Identify & Prevent Resource Scarcity Risks

1. Have you developed a set of leading risk indicators that is forward-looking, and based on continuous monitoring and analysis of critical resources?

2. Are you recognizing all the different types of risk that could affect your supply chain and product portfolio, including factors such as physical risks (just not there), economic risks (volatile pricing) and geo-political risks (political barriers).

3. Are risks being matched with appropriate remedial measures, such as inventory cushions and strategic stock piling, dual sourcing, dialogue with suppliers, and research and development on the substitution of resources at risk?

4. Do you have effective systems in place across your supply chain to identify and act on early-warning signs or, in the case of a sudden scarcity risk, to supply real-time information and enable fast implementation of preventive measures?

5. Are you consulting with your suppliers and customers to investigate new business models to reduce resource scarcity risks?

6. Are there opportunities in your sector to take an integrated, sustainable approach to your supply chain?

7. Are you identifying and promoting the environmental, economic and social

added value of your products, and feeding this back into product development?

8. Do you have modern process-control systems in place to manage production in ways that reduce or eliminate waste and, in turn, ensure minimal use of scarce resources like energy, water, metals, minerals and other scarce input?

9. Have you evaluated the potential of initiatives, such as extending product life, take-back programs, extended product responsibility and closing the loop in your product design, to reinforce customer relationships and sustain revenue streams, as well as boosting environmental sustainability?

10. Do you have effective lifecycle assessment and “cradle-to-cradle” strategies to design out or minimize harmful impact, and maximize benefits for any given production process?

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