

The Geopolitical Dimension of Resource Security Germany and Europe need a Resource Strategy

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Introduction

Resource Security has an often overlooked geo-political and geo-economic dimension. During the various holidays at the end of 2009 and the beginning of 2010 around the globe millions of mobile and smart phones were given as gifts to relatives and friends. For them and the production of other bestselling IT and Computer Equipment many rare strategic metals are needed – mostly in very small quantities. That’s why they have been coined “pepper-“ or “spice-metals”. Despite their small quantity in a single average cell phone they add up as the annual production of mobile phones has passed 1 Billion (!). One of these rare high-technology metals is Indium, which is not replaceable in the production of cell-phone displays. The by far biggest producer of Indium is China. That’s why it has set alarm bells ringing for many metalworking companies in industrialized countries when China announced last fall to restrict exports of strategic raw materials.

Raw materials are essential for modern societies. Therefore, a secure supply of raw materials at acceptable prices is of essential importance for Europe.

Increasing energy prices and the repeated gas conflict between Russia and the Ukraine revealed Europe’s dependence on oil and gas imports and put it on the political agenda. Comparable problems regarding the supply of non-energy raw materials have not yet reached the same level of political attention, although the supply risks, especially of some high technology metals, are higher than those for gas and oil.

Due to the transformation of numerous developing countries into emerging economies and the resulting high or even growing demand for raw materials in future, the supply situation will presumably continue to be tight. Moreover, raw materials conflicts are becoming a growing threat in many producing countries, fuelled by the unequal international access to these resources and a new geography of trade, caused by the rise of the emerging countries.

The private sector, national governments and the EU commission are asked to find ways to attain supply security through appropriate measures at company, state and EU level as well as at the international level. Apart from measures to secure access to raw materials, another significant way to reduce import dependency is to increase resource efficiency and to improve the recycling of secondary and waste materials.

Continuing Dependency on Raw Materials Imports

Europe is not lacking in raw materials. Nevertheless, some raw material deposits are included in development plans and are therefore either protected areas or are otherwise set aside for these and thus unavailable in terms of raw material production.

Europe's economy is considerably or completely dependent on imports of most of its needed raw materials, as for example the import of copper and iron ore, which together with other metallic raw materials that have to be imported, are essential for a number of industries – ranging from the aerospace, automotive engineering to electronic engineering and electrical industries.

Apart from these primary raw materials the economy requires a considerable amount of so-called secondary raw materials, i.e. scrap and waste materials. The need for secondary raw materials has increased between 40 to 60 per cent of the basic raw materials required for the metal production within the EU.

The export industry, which is of great importance to the economy, is a large consumer of raw material imports.

High import dependency also exists in the case of so-called high technology metals such as cobalt, platinum, titanium and rare earths. These strategic raw materials are essential for key industries and therefore for the technological future of Europe. Their importance to the production of technologically demanding products, e.g., for the conversion to a sustainable production and environmentally friendly products, is increasing.

Fundamental Changes on World Raw Materials Markets

Supply of raw materials

Given the irrevocable fact that the raw materials component of the earth's crust is finite, nonetheless, there are sufficient mineral resources which can satisfy the worldwide need for raw materials in the long term. High price volatility on the raw materials markets, observable since the turn of the millennium, is not caused, as often wrongly assumed, by depletion of the raw materials. The reserves-to-production ratio is 600 years for chrome and 190 years for platinum metals. Nevertheless, the prices of these and other metals with average reserves-to-production ratios are highly volatile. The market turbulence results from a supply and demand imbalance.

Global raw material supply is tightly linked and therefore open to various impacts, which one state or even individual companies can only control to a limited extent. Market disturbances may be caused by different reasons. These do not mostly result in a complete interruption of the raw material supply, but rather in delayed delivery, concentration processes in the mining industry, accompanied by negative consequences for competition or in instability of producing countries, which can lead to the short notice failure of whole production sites. However, market disturbances also occur – as seen in the past - when through the rapid growth of developing and emerging countries, the demand for raw materials increases unpredictably fast or when revolutionary technological pushes result in peaks of demand or a decline in demand.

The disturbance potential is especially high in cases with no (or no fast) options to substitute scarce and expensive raw materials. Thus, chrome is not substitutable in stainless steels,

cobalt not in wear-resistant alloys, indium not in liquid crystal displays and flat screens, and neodymium not in strong permanent magnets.

In addition, there is competition in demand among different economic sectors regarding certain raw materials. For example, tantalum is needed in electric engineering, in steel refinement and in surgery, platinum in chemistry and automotive industry. The strong cross linking of uses of raw material in different industry sectors has to date hardly been explored.

The high volatility of raw materials prices in the past has - to a large extent - its origin in false estimations by market participants, especially by mining companies. A first false estimation consisted of the fact that innovations had not been expected (in time). An example for this is the strong increase in the tin demand and tin price, as a result of the electric engineering industry's conversion to free plumb bobs, since these require a higher input of tin. The impetus of new technologies on the level of demand for raw materials shows the formative force of the technological change. In 2030, the need for some of these high technology raw materials is estimated to be a multiple of the current world production. The demand for gallium and neodymium in 2030 as a result of foreseeable technological innovations is six to three point eight times as high as the current total global production. Thin-layer-photovoltaics and fast integrated circuits are pushing the demand for gallium, in case of neodymium it is the already mentioned high-performing permanent magnets. Information on which innovations trigger a boom for a certain raw materials is strategic information for raw materials companies to attune in time their production capacities to the future need.

The second false estimation concerned the rapid development of the Chinese economy and the resulting import maelstrom of raw materials which came unexpectedly for many market participants. China, especially, contributed to the global economy's annual growth from moderate 3.8 per cent over years to 5 per cent since 2004. Fuelled by China's high economic growth, the five year-long raw materials-super cycle reached dimensions we have not seen yet in modern economic history. The global economic and financial crisis made most of the metal raw materials prices fall again from 2008; however, that was for a global economic crisis on a relatively high level.

The developments in China have been the main trigger of the most recent raw materials boom, lasting from 2003 to the economic and financial crisis 2008/2009, but were not the sole cause. The boom is also attributable to the typical cyclic investment behaviour of the raw materials sector. Even though India does not yet play a major role as a consumer on the raw materials markets, this should only be a question of time with view to the fast developing Indian economy. After the confirmation of the reform-oriented government of Premier Minister Singh in the federal elections in May this year, it can be assumed that India remains on the course to reform. China and India are the only large economies, which have grown considerably during the crisis in 2009 by 8 and 5 per cent respectively and will probably even show stronger grow in 2010.

The high, and even in the crisis (after a decline in 2008) currently once again increasing raw materials prices are not a result of a supply shock, but the result of large demand, which was triggered by a strong global economic growth.

For the future, it can be assumed that the growth of India and other emerging countries will considerably influence the demand for raw materials. The economic catching-up of the lesser developed world regions, for instance Africa, is desired and a prerequisite for a peaceful future. The fact that industrialised countries united in the OECD make up only 15 per cent of the world's population, but use 50 per cent of the mineral resources is not acceptable in the

long term, neither on a political nor a moral basis. A catching-up development of the poor countries will inevitably increase global economic growth more than the long-term average of the past. But even if the future annual economic growth declines again to annual growth rates of 3.8 per cent, the global economy's performance in 2030 will already be 2.4 times higher than in 2006, which will undoubtedly have a strong impetus on the future demand for raw materials.

The demand for mass raw materials, the so-called commodities, with a broad area of use such as iron and steel, copper and chrome, is likely to be pushed harder in future by the global economic growth, while the demand for high technology metals such as gallium, neodymium, indium etc. will rather be determined by technological progress. Both drivers should have the same effect on the demand for platinum metals, tantalum, titanium and cobalt.

One of the special characteristics of the production of metallic raw materials is the fact that they are often found collectively ("socialised"). Given the rise of ore production due to higher demand for a certain metal, other linked metals are being produced in a larger amount and vice versa. For example, the extremely scarce indium, for example, is extracted as a by-product of zinc. Further, in 2006, when a Japanese zinc smelter was closed, the indium supply decreased noticeably.

With regard to some metals such as platinum, indium and neodymium, the supply security is to be assessed critically for three main reasons. Firstly, these are strategic raw materials for our industry. Secondly, not only the dependency on imports is high, but the number of delivering countries is also small. Thirdly, there is no option to substitute these raw materials. China is the biggest producer of many high technology metals, which it increasingly uses in its own high-tech industry that is currently being developed. For many of these technologies, Beijing has imposed export restrictions, which is particularly serious in those cases in which China, as for example in the case of neodymium, virtually has a monopoly on world production with 97 per cent.

New risks caused by disturbed global markets

The most important mining areas for many high technology metals are in China, Africa, South America, Russia and Australia. Some of these countries and regions are economic or politically unstable, others are characterised by considerable government impact on the economy.

Emerging countries increasingly follow strategies which result in securing their own raw materials processing industries more privileged and less expensive access to domestic raw materials than access for foreign competitors. More than 450 export restrictions for more than 400 different raw materials were identified by the EU. Some emerging countries aim to gain privileged access to countries that are rich in raw materials. Thus, China has taken part in several large-scale projects to tap raw materials deposits in Africa.

Growing concentration and vertical integration of companies within the mining and processing sector was typical during the raw materials price boom. Given the continuing development, this may lead to competitive restrictions and thus to higher (oligopoly) prices.

Over 50 per cent of the most important raw materials deposits are located in countries with a per capita income under ten US dollar per day. For many of these poor raw materials exporting countries the richness in raw materials has turned out to be a "curse". The phenomenon "poverty despite richness of raw materials" can be explained by macro-

economic (“Dutch Disease”) and political-institutional deficits (“Bad Governance”). Nevertheless, there are two laudable exceptions, namely Chile and Botswana.

More than half of the worldwide raw materials production takes place in countries which are ranked as politically unstable or extremely unstable by the World Bank. Over 50 per cent of the metallic raw materials production solely originates from unstable or extremely unstable countries. In case of some metal ores, the complete world production comes from countries of this category. The political risk that these countries could fail as suppliers due to military conflicts, terrorism or the nationalisation of raw materials sources is relatively high. This danger primarily exists in Central Africa.

Establishment of Supply Security in Globalised Markets

Material efficiency increase and resource productivity

The critical dependency of the European industry on certain raw materials shows the urgency for a transition towards a more resource efficient economy and sustainable development. For this, resource efficiency, recycling and substitution as well as the increased use of renewable raw materials has to be promoted. Therefore, higher investments in particular in efficient recycling techniques are required, which cost-efficiently extract secondary raw materials in the quality of primary raw materials. Secondary raw materials are the only noteworthy domestic raw materials source in the case of metals. Recycling also improves energy efficiency, particularly in metal production, since here, the processing of secondary raw materials requires less energy than processing primary raw materials.

Developing domestic raw materials deposits

The development of new raw materials deposits needs to be made possible to secure the supply with domestic raw materials. Therefore, EU member countries should secure a co-equal balance between raw materials extraction and other areas of concern. Within the EU, the general framework also has to be designed in such that the sustainable supply with raw materials from European sources is favoured. Sustainable supply with raw materials from domestic sources requires more knowledge about existing deposits within the EU. By including national geological institutes more into regional development planning and, in addition, which should also be better linked Europe wide, the access to raw materials deposits could be remained open for a later development.

Strategies to secure raw materials imports

Raw material security is an economic good for which the state, in close co-operation with the private economy, has a responsibility to provide.

Company Level

Raw materials supply is primarily the task of the companies themselves, but only less than half of companies take measures to insure themselves against raw materials supply risks. For this, companies need a strategic approach, starting with obtaining strategic information about the development of their own needs (considering technological progress and increase of resource efficiency), about threatening raw materials shortages and potential price increases. Different instruments to secure the supply of raw materials, which aim at securing the acquisition of raw materials, recognising and dampening of raw materials shortages and price

increases as well as direct communication with raw materials producers and distributors, are available to companies.

A possible way to secure the supply of raw materials is the participation in raw materials mining (“backwards integration”). By this, the opportunities to purchase the raw material in question in sufficient quantities and quality are increased. Further, such participation prevents, to a certain extent negative consequences of supplier concentration. Nevertheless, this participation or even the direct purchase of a raw materials deposit is linked to high financial expenditures and hence, for most of German and European raw materials companies it is not an option.

The security of supply through long-term delivery contracts with a mining company, optionally linked with the agreement for a partnership, is however, for most companies a realistic option. Apart from this, diversification of the distribution relations is a classical instrument to spread the risk. In particular, smaller companies can strengthen their demand power also by cooperating when purchasing, for instance, in the form of purchase corporations. To insure against sudden raw materials price increases, different financial hedging instruments (OTC-Forwards, -swaps, -options and fluctuation margin strategies). Such hedging instruments are only possible for those raw materials that have an official reference price (e.g. stock exchange price). Maintenance of good business relations (“Good Practice”) between the partners of a value added chain is another instrument. Hereby, existential crisis of individual parts can be avoided along with ensuring survivability for all.

National Level

A reliable access to raw materials, unimpaired by market distortions, is an increasingly important prerequisite for Europe’s competitiveness.

Due to the EU’s high dependency on the import of raw materials, free global markets without trade distortions are a basic prerequisite for the secure supply of raw materials. Nevertheless, international raw materials markets are considerably characterised by trade and competition distortions. Especially major emerging countries use strategic measures, which distort trade and competition, to secure their own raw materials supply. As a consequence of the financial crisis, further trade distorting measures have been used. It is the state’s task to provide open and functional global raw materials markets and to stand up for equal competitive conditions for companies with all available instruments.

The political awareness of this problem has undoubtedly grown in recent years: A few member countries like Germany make trade and competition distortions regarding raw materials part of their bilateral talks. In order to face this problem efficiently, industry has proposed to supplement WTO-regulations by a ban on raw materials export restrictions. However, due to diverging interests of raw materials exporters and importers, this would not be easy to accomplish.

At the bilateral level, making the reduction of export restrictions for raw materials and competition distorting subsidies a condition for concluding trade agreements and for WTO accession agreements could be considered. Bilateral talks should be consistently aimed at reducing trade and competition distorting measures.

Furthermore, the national level assumes the more than important role to contribute with its foreign, development and trade policy instruments to the political and economic stability of

countries rich in raw materials. In short: EU member countries need an active and integrated raw materials diplomacy.

EU Level

At the EU level an active raw materials diplomacy is also required. The European Commission has made the reduction of trade and competition distortions in the raw materials sector an inherent part of negotiations with the countries concerned.

An integrated policy approach at the European level is aimed at to secure Europe's supply of raw materials. The political challenges for the supply with non-energy raw materials are multilayered and complex; they concern economic and environmental policies as well as foreign, trade and development policies. The European Commission has full or partial responsibility for many of the named policy fields. Therefore, the development of a cross-sectoral EU raw materials strategy, which reasonably complements the national strategies, is therefore worth striving for.

After being asked by the EU Council for Competitiveness, the Commission has meanwhile begun to develop such an integrated policy approach. In November 2008, it presented a draft for a raw materials strategy, which is based on three pillars: guarantee of non-discriminatory access to the raw materials traded on the global market, reduction of the primary raw materials consumption in the EU and the security of the supply with raw materials from domestic sources. To secure the access to the required raw materials, it strives for a better management of existing strategic partnerships and to multifaceted contacts to most of the states, being relevant in this context, and regional co-operations.

The dialogue concerning the access to raw materials in the framework of the current action plan 2008-2010 is particularly to be intensified with Africa. Furthermore, it is planned to intensify the dialogue with emerging countries rich in raw materials such as Russia and China, aiming especially at the abolishment of market-distorting measures (as for example, export restrictions).

Finally, there should be a dialogue on shared interests and initiatives to strengthen free global trade with countries similarly dependent on raw materials, such as Japan or the USA. Moreover, the EU aims to commit itself to increased international collaboration and win support for its position within the G8, OECD, UNCTAD and UNEP. The European commitment regarding future questions – as in seabed mining, the Arctic and safeguarding of international trade routes for raw materials - is to be welcomed. In respect of the integrated approach, the EU also counts on its development policy to reinforce national structures in many countries weak in raw materials production and support sustainable raw materials management.

In addition, the EU aims at contributing to an increase of the raw materials supply by promoting an advantageous investment climate. This also includes the demand on the EU competition authorities as well as member states to pay more attention to the concentration processes in the raw materials sectors in order not to endanger supply security with raw materials at acceptable prices by company mergers.

International Level

Many of the required measures to secure the raw materials supply in Germany and the European Union are neither to be achieved bilaterally nor at the EU level, but can only be implemented internationally and in co-operation with other interested partners. This includes a better collaboration in development co-operation as well as international transparency initiatives and other measures to sustainably stabilise and to develop developing countries, which are rich in raw materials, as part of a global resource management. In this context, so-called national raw materials funds for developing countries rich in raw materials (e.g. Central Africa) are included. Important criteria for the success of these funds is an independent management, also to make efficient public control possible, the transparency of income and expenditure to oppose corruption, as well as the appropriation of the income for sustainable development. Since many states are too weak to build up and operate raw materials funds along these criteria, they should be supported in this undertaking by international organisations (e.g. by a sub-organisation of the UN or the World Bank).

The creation of transparency regarding cash flows is an important instrument to fight against corruption and for Good Governance. The most important transparency initiative, which was agreed on under the British G8-Presidency, was the “Extractive Industries Transparency Initiative” (EITI). At the core, this initiative says that cash flows to public institutions in the area of raw materials extraction, as licence tax or permission costs, have to be disclosed by companies. By now, EITI runs a secretariat in Oslo and numerous states have now joined the initiative. The initiative “Publish What You Pay” strives for similar goals, and the “Global Reporting Initiative” aims at publishing environmental and social data.

The “International Council on Mining and Metals” (ICMM) has created ten sustainable standard principles for its member companies – a first important step to the creation and implementation of environmental and social standards. In addition to the Kimberley-certification process for diamonds, which has been in existence for quite a long time, an initiative for the certification of trade chains in the raw materials sector has been introduced by Germany. The German Federal Institute for Geology and Natural Resources has worked out a concept how trade routes of high-tech and precious metals such as tantalum, wolfram, tin and gold, especially from manual (artisanal) small-business mining could be controlled and certified. Raw materials illegally extracted and traded can be identified by geochemical “finger prints”, which are characteristic of each ore. At the same time, the concept shows how the journey of raw materials from local producers to industrial purchasers, being based on international environment and social standards, can be certified.

The information on raw materials and their usage stems from completely different sources. The establishment of an international institution for market monitoring could solve the problem and provide edited information to mining groups as well as to industries with a demand for raw materials. Information exchange between these industry players should result in a better co-ordinated raw materials supply and demand and in the reduction of the risk-carrying and therefore cost-producing volatility at raw materials markets.

Outlook

Raw materials security is no end in itself, but a decisive prerequisite for the industry’s competitiveness and therefore for wealth, growth and employment in Europe. Nobody is able to predict future developments of the raw materials markets. Nevertheless, the detailed analysis of the driving factors and the creation of transparency on fundamental market data

allow identifying resilient development trends. This trend goes towards an overall increasing raw materials demand. The price decline in the course of the global financial and economic crisis has not changed anything about the basic importance of reducing our raw materials dependency and to strive for a sustainable security of our raw materials imports. This also makes the gradual development of a Global-Governance-System for resource management more urgent which is related to the self-interests of companies and states and also to the listed international initiatives.

Remarks:

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