



# Enterprise Risk Management Policy in the KGHM Polska Miedź S.A. Capital Group

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## Abstract

*Under the current market conditions, risk is inherent in enterprise management. A well-functioning risk management policy is an added value for an enterprise. It allows its managers to focus on developing the company's development strategy, its value and competitiveness. They can effectively manage uncertainty and the related opportunities and risks, increasing the company's potential to build value. Risk management is aimed controlling and handling risks across the organisation. Understanding the risks faced by the enterprise leads to better strategic decisions, and thus better allocation of resources. Effective risk management also involves correctly predicting the risk factors for different time horizons, and the ability to consider different scenarios. Consequently, there is a need to collect highly detailed information on the activities of the whole enterprise.*

*The aim of this paper is to analyse selected aspects of enterprise risk management at the level of a capital group using the example of Grupa KGHM Polska Miedź S.A. as a global organisation.*

*Keywords: enterprise risk management, responsible business, internal audit*

## 1. Introduction

Under the current market conditions, risk is a key aspect of enterprise management. An effective risk management system constitutes an added value for the company. It allows its managers to focus on developing the company's development strategy, its value and competitiveness [3, 4, 8, 11]. They can effectively manage uncertainty and the related opportunities and risks, increasing the potential to build value. In order for its risk management efforts to be effective, the company must define the scopes of responsibility by indicating the respective roles and responsibilities of people and teams involved in the risk management process [1, 2, 9].

The Enterprise Risk Management Policy at the KGHM Polska Miedź S.A. Capital Group lays down a systemic approach to risk – from identification and assessment, to analysis and response, to monitoring risk levels. A comprehensive approach to risk management is consistent with the growth strategy, a constant drive towards operational excellence and the principles of sustainability and business responsibility [7]. It was designed in such a way as to support the establishment of a resilient corporate structure.

Uncertainty is intrinsic in business – there can be no profit without risk. However, risk must be taken responsibly, remembering that each employee should manage it in their respective areas of responsibility. The implementation of the enterprise risk management policy in day-to-day business will protect the stockholders' assets, the health and safety of employees, the natural environment and the goodwill of the company [10].

## 2. The concept of enterprise risk management policy in the KGHM Polska Miedź S.A. capital group

KGHM defines risk as the impact of uncertainty, which is an integral part of business and can lead to both opportunities

and risks to the implementation of business objectives. The current, future and potential impacts of risk on the Group's activities are subject to assessment. On the basis of an analysis, governance practices are reviewed and adjusted to respond to individual risks.

To achieve the enterprise's goals, it is necessary to develop a consistent and practical methodology of managing uncertainty at the level of the KGHM Group, its Companies, Branches and Projects, supported by an appropriate organisational structure and relevant regulations.

The assignment of authority and responsibility at KGHM Polska Miedź S.A. is guided by the best practices of Corporate Governance and the universally recognised three lines of defence model (Fig. 1).

The role of the Supervisory Board (Audit Committee) is to monitor the key risks and the methods of managing them. Once a year, the Supervisory Board assesses the effectiveness of the risk management process [10].

The Management Board is responsible towards the stockholders for the overall risk management system, supervision over the whole process and ensuring effective response to risk, and for transparent reporting hierarchies. The Management Board appoints Risk Committees at the level of the KGHM Group, whose task is to support effective risk management and monitor key risks on an ongoing basis.

The Management Board is responsible for risk identification, assessment and analysis and, as part of its day-to-day responsibilities, for responding to risk. It is the management's task to exercise ongoing supervision over the application of appropriate responses to risk as part of the implemented tasks to keep risks within tolerable limits. The management is expected to effectively allocate risk management authority and responsibility to lower management tiers [5].

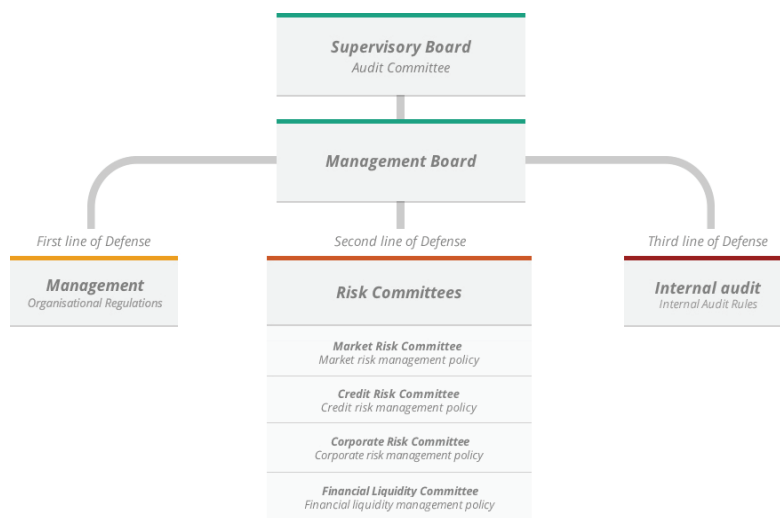


Fig. 1. The assignment of authority and responsibility at KGHM Polska Miedź S.A.  
Rys. 1. Zakres władzy i odpowiedzialności w KGHM Polska Miedź S.A.

The Department of Enterprise Risk Management and Supervision Standards is responsible for the coordination of the whole process of enterprise risk management and developing methods and tools used by managers in all Companies, Departments and Projects. The department is responsible for risk monitoring and communication, as well as incident reporting.

The Internal Audit is an important element of ensuring the effectiveness of the risk management system. The Annual Internal Audit Plan is based on risk assessment and subordinate to corporate objectives. Every audit task includes an assessment of the current level of each risk. Additionally, the Internal Audit is responsible for carrying out independent assessments of the adequacy and effectiveness of risk management, and gives recommendations to ensure the continuous improvement of risk management practices [6].

The process of enterprise risk management is laid down in the “Enterprise Risk Management Policy in the KGHM Polska Miedź S.A. Capital Group” document. Its purpose is to ensure that key risks have been identified, assessed and analysed, and that appropriate Risk Response Plans have been prepared on that basis, and that Adjustment Measures have been implemented to reduce risks and achieve the business objectives, supporting the identification of opportunities to gain a competitive edge.

The management of individual risks is the subject of separate detailed regulations across the Group’s companies. The KGHM Polska Miedź S.A. company, as part of its activities, actively manages market risk, credit risk, financial liquidity and random incident risk.

### 3. Selected aspects of the enterprise risk management policy in the KGHM Polska Miedź S.A. capital group

The purpose of the Policy is to define the principles and framework of the risk management process, assign responsibilities and defines the basic concepts related to risk.

For risk management, the KGHM Group utilises a cross-organisation approach based on recognised international standards and best industry practices. By having a solution adjusted to the specific challenges of its industry, the company can consistently identify, assess and analyse risks, and use

the related conclusions to design responses that keep risks within tolerable limits.

Achieving the objectives of risk management is key for the KGHM Group as a global organisation committed to building and maintaining a reputation as a responsible, transparent and resilient company. For this reason, all employees of the KGHM Group are involved in enterprise risk management.

The objectives of risk management include [10]:

- Ensuring the creation and protection of value for stockholders by establishing a consistent approach to risk identification, assessment and analysis, and implementing responses to key risks;
- Supporting the achievement of business objectives by implementing early risk warning and opportunity identification measures;
- Providing strong decision-making support at all levels of the organisation;
- Building an organisation which is aware of the risks it takes and strives for continuous improvement;
- Protecting the lives and health of its employees, the natural environment and the goodwill of the brand.

The enterprise risk management process adopted at the KGHM Group is inspired by the solutions proposed by the ISO 31000:2012 standard, best risk management practices and the specific requirements of the KGHM Group. It consists of the following stages (Fig. 2):

1. Risk context determination
2. Risk identification and assessment
3. Risk analysis and response
4. Risk monitoring and communication

The first step in the process can be broken down into three measures, including defining the external, internal and risk management contexts. The external context is the environment in which the group acts in implementing its strategy. This measure should be implemented with an up-to-date understanding of the social, political, legal, regulatory, financial, economic and technological aspects of the organisation’s

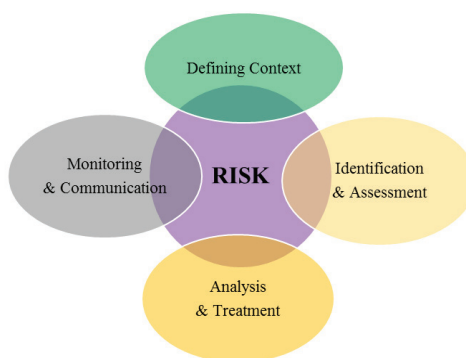


Fig. 2. Risk management process at KGHM Polska Miedź S.A.  
Rys. 2. Proces zarządzania ryzykiem w KGHM Polska Miedź S.A.

environment that affect the group's business. The internal context is defined on the basis of an analysis of the business objectives, the planned and conducted changes in the organisational structure, acquisitions and mergers, new areas of activity, etc. The last thing to do in this step is to define the context of risk management, which includes establishing or updating business objectives, strategies, scopes of responsibility and the procedures and methodologies applied in the risk management process. This results in a calibrated Risk Assessment Matrix, which includes the scaled assessment ranges for impact and vulnerability, according to which the risk assessment is carried out.

The second stage of the process involves the identification and assessment of risks that can influence the achievement of business objectives at the level of the KGHM Group, its Branches and Projects. The main purpose of this stage is to prepare a comprehensive list of risks which can facilitate, impede, accelerate or delay achieving business objectives. After this, the identified risks are assessed using the Risk Assessment Matrix. This stage also covers the identification of potential risk sources and the potential financial and non-financial effects of their materialisation for the individual areas of the organisation.

The objective of the third stage is to gain new insights into, and a better understanding of, the key risks identified during the previous stage. The cause-and-effect analyses and detailed descriptions of risk management methods are meant to facilitate decisions on whether to maintain or change the procedures in place. This decision is called "Response to risk". Changing procedures involves defining the Adjustment Measures, i.e. organisational, process-related, systemic and other changes aimed at better mitigation of key risk and reducing exposure to tolerable levels. The key risks are subject to analysis documented in the Detailed Risk Card. The applicable Key Risk Indicators (KRI) are also defined during this process. These involve a set of parameters of a business process or environment which, when changed, affect the level of risk and should be monitored to predict its possible changes.

The purpose of the risk monitoring process and communication is to ensure that the response to risk is effective (ad hoc and periodical reports), that new risks are identified (updating the Risk Register), that changes in the internal and external environment and their effect on business have been identified, and that appropriate action has been taken in re-

sponse to incidents (updating information on Incidents in the Risk Register). The effective monitoring of risk involves periodical calibration reviews of the Key Risk Indicators and ensuring the completeness and timeliness of reporting on the implementation status of selected responses to risk (updating information on Adjustment Measures in the Risk Register). Risk monitoring also involves audits carried out by the Internal Audit.

The objectives of the communication process:

- ensuring the availability of useful, complete and up-to-date information on risk in the decision-making process as needed;
- ensuring that all participants in the risk management process are dedicated to fulfilling their responsibilities and promoting an organisational culture that contributes to greater awareness of risk management
- ensuring transparency, completeness, precision and clarity of information for all stake-holders (both internal and external);
- ensuring that all participants in the risk management process have the same understanding of the threats and opportunities associated with risk.

#### 4. Conclusions

The objective of KGHM Group is to manage uncertainty and protect the stockholders' assets by having a consistent and effective risk management process in place. Through a structured and regular approach to risk management, KGHM Group has identified its key risks. These risks are the object of KGHM Group's special attention. Risk Committees periodically review current risk levels, supervise the implementation of risk response plans, assess the general risk resilience of the KGHM Group and communicate issues associated with risk reduction to the Management Board.

Continuous learning and refinement are extremely important elements of the risk management process. For this reason, the enterprise places great emphasis on developing risk management awareness within the KGHM Group, providing training and encouraging employees to use their knowledge on risks in their daily activities.

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*Polityka zarządzania ryzykiem korporacyjnym w grupie kapitałowej KGHM Polska Miedź S.A.*  
W obecnych warunkach rynkowych zagadnienie ryzyka jest nieodłącznym elementem zarządzania przedsiębiorstwem. Z kolei doskonale funkcjonujący system zarządzania ryzykiem stanowi wartość dodaną firmy. Pozwala zarządzającym skoncentrować się na budowaniu strategii rozwoju, wartości i konkurencyjności organizacji. Umożliwia zarządom skuteczne radzenie sobie z niepewnością oraz związanym z nią ryzykiem i szansami, zwiększając tym samym zdolność do budowania wartości. Zarządzanie ryzykiem jest przedsięwzięciem, którego celem jest kontrola i zarządzanie ryzykiem całej instytucji. Zrozumienie ryzyk zagrażających firmie pozwala na podejmowanie korzystniejszych decyzji strategicznych, oraz, dzięki temu, na lepsze wykorzystywanie zasobów firmy. Skuteczne zarządzanie ryzykiem polega również na trafnym prognozowaniu czynników ryzyka w różnych horyzontach czasowych oraz rozważaniu różnych scenariuszy. Konsekwencją tak postawionego zagadnienia jest konieczność zbierania bardzo szczegółowych informacji na temat działalności całego przedsiębiorstwa.  
Celem artykułu jest spojrzenie z poziomu grupy kapitałowej na wybrane aspekty zarządzania ryzykiem korporacyjnym na przykładzie Grupy KGHM Polska Miedź S.A. jako organizacji o zasięgu globalnym.

Słowa kluczowe: zarządzanie ryzykiem korporacyjnym, odpowiedzialny biznes, audyt wewnętrzny



# Critical Raw Materials – What’s the Crux of the Matter?

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## Abstract

The paper takes into account mineral commodities that have been listed as critical by the EU Commission. It concentrates attention on the issue of global demand/supply balances, and summarizes causes for critical listing of these commodities.

*Keywords: critical raw materials, tungsten, fluorspar, niobium, graphite*

## Introduction

It is a specific feature of some mineral commodities that they cannot be recuperated or their occurrence changed. As such, mineral resource utilization for smooth operation of national economies asks for some interference with free market mechanism. It is about setting of rules, extent and form of raw material exploitation to ensure considerate consumption of national resources. Significance of some mineral resources, regard to individual rights and collective interests, as well principles of sustainable growth must all be taken into account.

Securing access to a stable supply of many raw materials has become a major challenge for national and regional economies with limited production, such as the European Union economy, which relies on imports of many minerals and metals. To address the growing concern of securing valuable raw materials for the EU economy, the European Commission launched the Raw Materials Initiative in 2008. It is an integrated strategy that established targeted measures to secure and improve access to raw materials for the EU. One of the priority actions of the Initiative was to establish a list of critical non-energy raw materials at EU level. The first list was established in 2011 and it is updated every three years. List of 2017 Critical Raw Materials is following: antimony, barite, beryllium, bismuth, borate, cobalt, fluorspar, gallium, germanium, hafnium, helium, “heavy” rare earth elements, indium, “light” rare earth elements, magnesium, natural graphite, natural rubber, niobium, platinum-group metals, phosphate rock, phosphorus, scandium, silicon metal, tantalum, tungsten, vanadium (European Commission, June 2017.)

## The main parameters used to determine criticality for raw materials in the EU were:

1. Economic importance: it was assessed in terms of end-use applications and the value added of corresponding EU manufacturing sectors. The economic importance is corrected by the substitutes for individual applications.

2. Supply risk: reflect the risk of disruption in the EU supply of the material. The estimation of the supply risk is based on:

- Stability/instability of producing countries and level of concentration of producing countries.
- Extent to which a raw material may be substituted (easily and completely, substitutable at low cost, substitutable at high cost and/or loss of performance, not substitutable).
- Extent to which raw material needs are affected by recycling from new or old scrap. New scrap is resulting from the processing of raw materials from primary sources, old scrap refers to raw materials which have been recycled at the end of the product life.
- The supply risk is increased if the producing countries are unstable and provide a high share in the world production, the substitutability is low, and recycled rate is low as well (European Commission, 30. July 2010).

There are different reasons for listing of raw material commodities as critical. Their listing reflects the commodity current situation regarding their stocks, supply and demand balance, sudden market imbalances, price trends, etc. We are about to concentrate on the situation of tungsten, niobium, natural graphite, and fluorite.

## Materials and methods

### Tungsten

Tungsten is certainly a strategic metal as it has significant use in military and many other industrial applications. Tungsten demand is influenced by the vicissitudes of world economy and occurrence of war events – World War I and II, Korean and Vietnam conflicts, world economic crisis of the 1930s and financial crisis connected with 2008.

Major tungsten deposits are located in China. In 2010, about 85% of the world’s tungsten production came from

China which is the world's largest tungsten consumer, with approximately half of total world consumption. Europe's import dependence for tungsten is estimated at 74% (European Commission, 2017-09-11).

Supply and demand fluctuations are subject of the current economic conditions, occurrences of war or political interventions. These influences are directly mirrored by changing quotas of production, import, or consumption. To ensure the domestic supply, the Chinese government limited foreign investment in prospecting and extraction of tungsten ores, restricted issuing of new mining licenses in 2007, and reduced export of raw materials of low added value in 2013.

Tungsten substitution possibilities are circumscribed by cost of alternative materials/technologies, lesser performance, and less environmental friendly alternatives.

Tungsten scrap has high tungsten content; therefore recycling is important in meeting the total tungsten demand. It is estimated that secondary tungsten (scrap) can cover about 34% of total tungsten demand (European Commission, 2017-09-11). Overall, the market for tungsten is expected to remain roughly in balance.

### **Niobium**

Niobium is mainly used in the manufacture of steel for construction and high temperature applications. Worldwide, niobium is very widespread, but rarely accumulated in high concentrations. Almost all world reserves are located in Brazil and over 5% of global reserves are in Canada. It is supposed that niobium resources are more than adequate to supply future needs.

Niobium production is concentrated in Brazil (92%), niobium is also mined in Canada (7%) and Nigeria (1%). There is no production in the EU (European Commission, 2017-09-11). The EU's share of consumption is approximately 24% of the world total consumption, other major niobium consuming regions include China (25%), Americas (21%), Japan (10%), and other Asian countries (11%). Rises in mining capacity or the opening of new deposits mean that total niobium production will keep pace with – and slightly exceed – consumption forecasts.

Substitution of niobium is possible, but it may involve higher costs and/or a loss in performance.

Reduction of niobium consumption can be achieved by the recycling of niobium-containing steels and super-alloys. The estimated share of recycling on the total consumption is 20%. Since there is no primary niobium production in Europe, scrap is the only available intra-European raw material source. Ores and concentrates, oxides, and niobium metal per se have to be imported.

### **Natural graphite**

Nowadays, the most of graphite use refers to refractory applications. Other key industrial applications include lubricants, steel-making, metal casting, brake lining. An important emerging use for graphite is for lithium-ion batteries used in hybrid and electric vehicles.

The greatest reserves of natural graphite are in China that is followed by India. China is the world's dominant producer accounting for 68% of the world supply in 2012. Neverthe-

less, China produces low quality graphite that is unsuitable for high-tech applications. To provide for their own needs, China has set export limits on natural graphite in place. China applies a 20% export tax on natural graphite. Concerning relationship of demand and supply, a balance trend has been noted. Nonetheless, long-term developmental trends will be subject of green technology standards and economic or restrictive policies of the Chinese government.

The most common substitutes for graphite are other forms of carbon (coke, anthracite). Synthetic graphite can be used as a substitute for natural graphite in some applications.

At present, recycling of graphite from old scrap is very limited. A lack of economic incentive combined with technical challenges has stalled the market for recycled graphite.

### **Fluorspar**

More than a half of worldwide fluorspar consumption is used to produce hydrofluoric acid, the bulk of remaining fluorspar consumption is used as flux in aluminium, steel and ceramics production processes.

Taking a look at the current consumption, world reserves can meet demand for more than 40 years. Phosphate is another source of fluorine. The greatest fluorspar reserves are in South Africa, Mexico and China. China is the world's largest consumer of fluorspar, with nearly half of consumption worldwide. China implemented an export tax (15% in 2007) and export quotas in 2010 (European Commission, 2017-09-11).

Substitution possibilities seem to be limited, fluorosilicic acid is the only substitute which could have a significant impact on global fluorspar extraction.

Recycling of the raw material mineral is impossible.

### **Discussion**

Regarding the commodities analysed, they can be characterized as follows:

- Application significance: industry (niobium, graphite, fluorite) inclusive defence industries (tungsten) or green technologies (graphite),
- Reserves: satisfactory but nearly exclusively localized in China (tungsten, graphite) or Brazil (niobium),
- Single country prevailing production: China (tungsten, 85%; graphite, 65%; fluorite, 58%), Brazil (niobium, 92%),
- Commercial and economic restrictions: China (tungsten, graphite, fluorite),
- Substitution limitation (fluorspar) or production cost increase (niobium),
- Recycling impracticable (fluorspar) or restrained (graphite).

### **Conclusion**

It can be assumed that listing of individual mineral commodities as critical was primarily affected by their application significance in the EU countries, stockpile availability, production/consumption of individual countries, limited or impracticable recycling, and last but not least commercial/economic restrictions. A similar situation can be anticipated as regards criticality of other raw materials.

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#### *Lista pierwiastków krytycznych – jakie są kryteria zaliczenia pierwiastków?*

*W artykule przedstawiono surowce mineralne wymienione przez Komisję Europejską jako krytyczne. Koncentruje uwagę na globalnym popycie i podsumowuje przyczyny zestawienia listy pierwiastków krytycznych.*

*Słowa kluczowe: surowce krytyczne, wolfram, fluoryt, niob, grafit*