University of Belgrade
Technical Faculty in Bor and
Mining and Metallurgy Institute Bor

43rd International October Conference on Mining and Metallurgy

IOC2011 PROCEEDINGS

Editors:
Desimir Marković
Dragana Živković
Svetlana Nestorović

October 12 - 15, 2011
Kladovo, Serbia

KEY BUSINESS RISKS IN THE MINING DEVELOPMENT IN THE BOR BASIN OF COPPER

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Abstract

The paper gives an overview of the global business risks and risks in the mining development and the possible impact they could have on the future development of the Bor basin of copper. Risks in the further development of mining are emphasized by global economic and financial crisis. An identification of main risks is undertaken by application of a comprehensive development framework approach. Paper indicates that an evaluation of possible impacts of risks on the future development of Bor basin shows that these impacts must be included in corporative decision and compilation plans on the local and regional level.

***Keywords**: business risks, mining, recovery, restructuring and privatization, Kyoto protocol*

1. INTRODUCTION

Risks are characteristic of every strategic development and business decision-making, so their successful management should be a part of the development strategy of the corporation, especially long-term. Among the key risks at a corporate level are the financial risks and risks of the regulative framework, especially in the field of environment and land use. In both cases, it is a question of external risks, which the companies need to relativize and successfully manage. Some companies pay more attention to production risks and search for better solutions in that domain, which, however, is not enough [1]. The analysis has included the identification and assessment of the risk and uncertainty impact on the future development of the copper complex in the mining-smelting basin Bor. There are a number of methods for identification and management of business risks as part of strategic management and strategic planning. The analysis based on the comprehensive development framework approach (CDF), as the broadest integrated framework for the preliminary general, sectoral and corporate risk assessment & management. Risk management include transferring the risk to other parts, avoiding the risk, preventing hazard, reducing the negative effect or probability of the risk, accepting some or all of the consequences of a particular risk. That implies four methods to manage risk - Avoid Risk, Control Risk, Transfer Risk, or Retain Risk. The research has included the general market trend and market positioning of the production and copper processing complex in the world; the impact of the requirements and strategic goals of the EU Directive and Kyoto Protocol on the institutional and other adjustments important for business in this sector; the impact assessment of the regulations important for business in the mining and metals sector, especially environmental and land-use/spatial rules.

2. EXPERIMENTAL

The identification of main risks of the further development in the Bor basin of copper is based on the CDF, i.e. on comprehensive integrated approach in planning through cooperation between different levels of management and decision making. Methodological approach involves correlation and linkages between inter/national, sub/regional and local levels together with corporative level. The approach implies mobilization of corporative and inner strengths and resources in development and mitigation of effects of global economic crisis, with emphasizing local responsibility and strengthening public-private partnership.

The strategic business risks in mining and metals sector (the top 10) are*: I – macro risks* (retaining social work permits, challenges of climate change, resource nationalism*), II - sectorial* (industrial consolidation, lack of quality infrastructure, increase of regulations), *III - production risks* (certainty in energy use, rise of costs, access to infrastructure, shortage of skills and educated workforce)[2,3,4].

Key strategic risks of mining and metals in sector of copper complex are: changes in the market; the economics of copper sector - large-volume purchases and acquisitions of companies, the emergence of oligopoly and rapid expansion of smelters capacity in developing countries; the impact of market trends on the companies consolidation, the value added and competitiveness; increase the market value of mining companies 5 times from Q4 2008- Q I 2011. [19]; movement copper price on LME and other stock exchanges and the growing influence of investment funds on the price of copper; the impact of environmental regulations and requirements of climate change on costs, competitiveness and business; energy efficiency in the copper complex; sustainable development strategies, technological development and innovation, development of hi-tech manufacturing; recycling of copper; globalization and international cooperation in copper sector.

Development of copper sector is characterized by the growth of copper production and taking leadership of China; market and financial impact of the so-called "China effect" on development and competitiveness of the sector; increasing the number of regulatory rules (a total of 400 of which 250 established China); impact of EU directives (ETS, CCS, IPPC, Directive on construction, etc..) and the Kyoto Protocol requirements on the cost growth, competitiveness and profits of companies; growth in production costs; increase investment in innovation, hi-tech technology, infrastructure, sustainable development; socially responsible development, partnerships, integration of companies; better water management and energy, etc.

3. RESULTS AND DISCUSSION

We have identified several key strategic business risks for the further development of Bor basin.

1. Market positioning of copper complex

Dynamic changes in the increase of copper demand, over longer periods, have triggered development changes up to the period of the global economic and financial crisis. The basic assessments on the growth of copper demand on the market in the period 1980-2008 were 3% annually, with exception of China where the growth was 10% till 2008. Until 2014, an estimated demand growth of 3.7% per year, 6.9% in China.The existing and planned deficits in raw materials, concentrates and finished copper products indicates *a future increase in the construction of new production and processing capacities and growth of current capacities*. The assumption is that in several years it will be cheaper to build than to buy capacities. Rapid growth in copper prices on the market were till the end 2008 >8000 $/t, with least level at the Q1 2009 - 3,100 $/t, and maximum in June 2011 >10,640 $/t [5]. The rise of the price of copper indicates signals of recovery in its demand and better market positioning of the copper sector, including and the corporation RTB Bor.

2. *Shortage of qualifications, knowledge and skills* - The growth and further development of the sector imply qualified human resources, employees with skills and knowledge. Shortage of such human resources, especially managers, engineers and others is the main strategic business risk for the company MSB Bor. Due to the difficult economic situation in the period after 2002, 10,000 inhabitants have moved out of the Bor municipality, i.e., around 20% of the total population [6].

3. Industrial consolidation - restructuring and privatization of the companies RTB Bor - The basic orientations of development policies for the following period are determined by the development and modernization of the mining and metallurgy complex in the Bor basin, according to the results of the restructuring and privatization. After restructuring of company [7,8,9], three big enterprises undergoing restructuring within RTB Group have so far had three unsuccessful tender sales of state-

owned capital. In May 2009, the Government of Serbia decided to convert RTB Bor's debt to the government into capital and to be a major shareholder in the company.

4. *Access to infrastructure* - The expansion of production in the mining and metals sector is being faced with increasing obstacles regarding access to infrastructure. From the viewpoint of regional transportation communications, this region is located approximately 75 km from Corridor X and approximately 40 km from Corridor VII Danube. MSB Bor uses for transporting ores and finished products port Prahovo on the Danube, from where they are transferred to Bor by rail some 45 km. There is evident lack of government funds for the quality maintenance of the rail infrastructure.

5. *Accessibility to deposits and preserving social work permits* - Deposits of copper are defined through ore field Crni Vrh, Cerovo – Mali Krivelj, Veliki Krivelj and ore field Bor. The estimated copper reserves for exploatation are 1.1 billion t. Within the period of fifty years, the exploitation of the ore body the Bor River with estimated reserves of 600 million t [10]. Primary gold and copper deposits are located in the mountain Crni Vrh. The concession for research and exploitation of new mines on Crni Vrh was obtained by the company "Dundee" with exploitation rights on 150 km2 or 20% of the municipality Bor[11,12].Preserving permits or obtaining new ones is becoming difficult.

6. *Harmonization and the Kyoto Protocol,* which Serbia has ratified in 2007 [13] - Mining companies will have to adjust their business to the requirements of ecological regulations towards a low-carbon economy. Most companies will accept minimal responsibility and will radically lower their carbon intensity. The EU Climate Package was adopted in December 2008, and includes the EU ETS Directive, Directive on renewable sources and Directive CCS. The industrial capacities that use fossil fuels will have to implement the CCS by 2020, which is becoming the general requirement for the industries of Europe [1]. Serbia is not on the list of Annex B of the Kyoto Protocol and is not obligated to reduce the amount of greenhouse emissions, but was given the possibility to adopt this obligation.

7. *Increase of costs* - While higher prices of commodity goods influence the increase of company revenue, the prices of capital and the increase of production costs make them marginal. The danger of an increase in costs is vital for company competitiveness. The greatest influence on the competitiveness of the copper manufacturers have production costs, the amount of copper in an ore, the method of mining, the productivity level and economy, the scope of gangue, equipment, traces of assistant metals. The structure of costs of the mining industry linked to regulatory policies and depends mainly on local factors, while the prices of metals are determined on the market. The main components of the structure of costs in the copper complex are energy products, ecological taxation and employment costs.

8. Ecological problems in the Bor basin. According to the EU Program on the environment and sustainable development [14], it is estimated that the environmental quality in the Danube Basin and Eastern Serbia are among the most endangered in Europe. According to the Spatial Plan of Serbia [15] , in the planned state of the environment, the region Bor is classified as category II - very polluted sites. Bor is an environmental hot spot in Serbia. The worst effects were caused by the open mines and technological processes in flotation and smelter [16]. Environmental problems include waste dumps, flotation tailings, mining and processing waste waters and air pollution in the Bor basin, Danube area and the wide region[17,18].

9. *Certainty in energy use* - Availability and certainty in energy use for MSB Bor has been provided in total, even in the previous periods. The mining copper basin MSB Bor is located near the hydro power plant „Đerdap" I and II, with a developed electric power system infrastructure. One of the uncertainties in the future development of MSB Bor is the possibility of a rapid or slow construction of the gas pipeline „South Stream", or the abandoning of its construction. It is expected that the construction of the pipeline „South Stream" will be finished by the period around 2015.

10. *Increase of regulations* - With the uncertainties on the global market of metals, there are rising political (and environmental) pressures on the mining and metals complex. This has an impact on competitiveness and corporative responsibility. Some of the strategic risks such as consolidation of firms, climate change concern and preservation of social work permits all lead to an ambience in which the global regulators are increasing the requirements for the mining and metals sector. Among other risks are: risks of resettlement, *emergence of independent rich funds*, *availability and limitations of wate, increasing the importance of communication with NGOs and the public is a growing risk, introduction of private ordinary shares into the mining sector* as business risk [1].

4. CONCLUSION

The main risks for the further development of the Bor basin of copper are identified on the basis CDF approach: 1) delay in the process of restructuring, consolidation and the completion of privatisation, as well as alternatives to a development that is not based on the principles of sustainability; 2) environmental requirements for the optimal utilization of resources and the protection of the environment - delay preparations of the plant MSB Bor for implementing measures of environmental protection, in accordance with domestic rules and EU regulations, especially regarding the recovery from SO_2, CO_2, emissions, ashes, dust, heavy metals and other pollutants; 3) growth of costs because aplication of environmental regulative; 4) overconsumption of energy products and the level of energy efficiency in the system of RTB Bor; 5) the lack of highly-educated and skilled workers; 6) slow application of technological innovations and knowledge.7)the lack of capital for new investments into research and development of deposits, etc.

Risk management in the further development of the Basin Bor (corporation and region) implies a lot of methods to surpass key risks (mentioned four methods and, e.g. SEA, EIA, CRI, calculations RA, FMEA, CRAMM, ISO, etc.). The implementation of measures and controls should be included in corporative decisions (business continuity planning-BCP), risk management plans, strategic plans, operative plans and compilation local/regional plans.

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