

## MINING REVIVAL – A CHANCE FOR RECOVERING FROM CRISIS

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**Abstract:** *The development of the human society has always depended on material resources and energy. Mining provides the basic minerals and conventional source of energy necessary for all other industries. Therefore mining, together with agriculture, forestry and fishing represent the basis of the economy. Accepting the necessity of mining represents a step towards the roots of the economy. Europe has a long tradition in mining. It was assessed that the rich reserves have been exploited and it started to be too expensive to continue mining. Nevertheless, Europe still has resources, the progress of the technology and the increase of demand for resources made the European countries turn once more towards mining. The renewable sources of energy are still too expensive, and so coal continues to be needed. Romania, as a part of Europe, faces the same challenges, and Romanian mining needs to go on. The present paper shows why mining must go on in Romania and particularly in the Jiu Valley.*

*The paper gives a systematic and holistic overview of the challenges and opportunities which are ahead the Romanian mining industry in the upcoming two decades, in conjunction with the evolution of European and/or national economic policies and strategies.*

**Keywords:** *mining, raw materials, SWOT analysis, energy market, strategic objectives*

### 1. INTRODUCTION

According to Prof. Dr. Carsten Drebenstedt from the TU Bergakademie Freiberg, Germany: "The need for raw materials will increase in the whole world, especially in the emerging economies. Therefore efficient and eco-friendly possibilities are required in order to satisfy the demand all over the world."

After some twenty years of reducing or even closure of the mining in Europe, the new policy is to revive it, due to the need to create new jobs and to ensure supply of critical materials.

Mining is also necessary because no mining means vulnerability related to raw materials imports, as for instance the suppliers can increase the prices and there is no control over the quantity, quality or economic policy of the exporting countries.

Also according to Prof. Drebenstedt, the operating efficiency of a mine depends on the technological progress. As new technologies emerge, mines or deposits formerly considered uneconomical, inefficient, are likely to become exploitable from technical and economical point of view.

### 2. NEW TRENDS IN EUROPEAN MINING

**2.1. General aspects.** "Europe is rich in natural resources. Our future is one where technological advances lead our industry, where regulation compliments growth and is born from a hard-won consensus for a better future" said Mark Rachovides, President of Euromines.[1] New or resurrected mining and smelting projects in some areas of Europe may provide perspectives for economic growth in the region, as countries fight against recession and unemployment. Some of the European countries are attracting investments with good grades of ore, a large labour pool, improved mining regulations and low political risk.

"Spain has gone from being shy of mining to being welcoming of mining. The political landscape has turned 180 degrees," said EMED Mining Chief Executive Harry Anagnostaras-Adams, whose London-listed company plans to reopen a former Rio Tinto copper mine near Seville. "There has been a marked transformation between when we arrived six years ago, when mining was not conventionally regarded as a favourite industry, to today when it overshadows most other initiatives in the area."

At EU level, new policy initiatives on raw materials have been adopted in order to create jobs and reduce the dependency on imports of vital raw materials. The EU is the world's largest or second-largest producer of some industrial minerals, including feldspar - used in glass and ceramics - and construction mineral gypsum.

It remains an importer of most others including copper, zinc and tin. Its domestic production of metallic minerals is limited to about 3 percent of world output.

Meanwhile, the leading emerging market producers of minerals in Africa and Asia started to adopt new strategies in order to protect their resources for the development of the future generations as well as for domestic markets.

"Growing resource nationalism in many parts of world makes Europe more attractive from a political risk point of view," said Magnus Ericsson, analyst at the Raw Materials Group. According to him, "There's also a slow but steady process of re-formulating EU policy and making it more positive towards mining in Europe to secure supply of metals. There are a number of exploration and investment projects that might come on stream in the next four to five years."

But in order to allow the revival of mining in the European Union, the legislation must be changed, bureaucracy and policy related to this issue must be adapted in order to bring on a full mining revival, in correlation with the principles of the sustainable development.

"The EU is trying to stimulate mining and reduce the dependency of imported raw materials ... but at the same time some of the EU regulators make it much more difficult to operate in Europe," Lundin Mining Chief Executive Paul Conibear.

**2.2. New mining policies in some European countries** Among the changes so far, Portugal has partly changed its labour code, which in the past was punitive for companies such as miners that must operate 24 hours a day, seven days a week to be viable. Another example is Sweden, who has lowered its corporate income tax from 26 percent to 22.5 percent to attract heavy industry investment such as mining.

Lundin Mining Corporation, which produces copper, zinc, lead and nickel from operations in Portugal, Sweden and Spain is currently expanding its Portuguese and Swedish mines and is actively looking for new base metals assets in eastern Europe.

In order to improve its energy saving and efficiency, Rio Tinto has invested nearly 80 million EUR in its Dunkirk aluminium plant in France in the past 18 months and plans to invest at least that much again over the next five years.

Trafigura, the world's third-largest trader in raw materials, intends to invest more than 300 million EUR into a copper, zinc and lead mine recently acquired in Spain.

Trader Glencore has reopened its Portovesme lead smelter in Sardinia.

Finland has attracted more new mineral discoveries and mine projects than other parts of Europe as a result of favorable mining legislation and an attractive tax regime.

Certain ex-communist Central and Eastern European countries are also trying to revive their mining sectors, but with varying degrees of success, Conibear said.

Slovakia has substantial untapped industrial metals and coal reserves, EMED's Anagnostaras-Adams said.

The European Commission announced to issue new recommendations to revive the steel industry, which has been affected by low demand and high energy costs compared to rivals in the Middle East and United States.

The "EU steel action plan" is the first comprehensive attempt by the Commission to stem a decline in the steel sector since the Davignon Plan sought to tackle an industry slump in the mid-1970s. A similar plan is in the works for the aluminium industry. [2]

In Germany (the greatest coal producer in the European Union), there is a revival of mining in the Ore Mountains (das Erzgebirge), in the south of Saxony. After more than 20 years of break, a new mine was opened in Oberwiesenthal. Since the prices on the world raw material markets have increased, the region became again interesting. [3]

While most of the nations are privatising their companies, France is founding a state-owned mining corporation, ten years after the closure of the last French coal mine. Arnaud Montebourg, the French minister for re-industrialisation, seems to bring back the ideas of Colbert...

The new state corporation will seek for instance for lithium deposits, a metal needed for batteries. This concern is intended to be used in order to defend the national interest of France.

The state will invest some 200–400 million EUR in the Compagnie nationale des mines de France (CMF) in the next five to seven years. This company will be active also overseas, not only on the French soil. [4]

### 3. MINING IN ROMANIA

**3.1. Raw materials in Romania.** In European terms, Romania is rich in mineral potential, especially oil, gas, salt, gold and silver ores and non-ferrous metals. Historically, the Romanian mining industry has frequently been at the forefront of European development, often leading the way to the identification and evaluation of deposit types that have subsequently proved to be of major importance elsewhere.

Table 1 Useful mineral substances of Romania

Substance or group of mineral substances	Mineral resource at January 1 <sup>st</sup> , 2011		Net production during the year 2011	
	Unit	Quantity	Unit	Quantity
Lignite	Mt	3,296	000 t	33,293
Hard coal	Mt	602	000 t	2,122
Gold&silver ore deposits	Mt	760	000 t	0
Poymetallic ore deposits	Mt	67	000 t	0
Copper ore	Mt	443	000 t	31.8 concentrated of copper
Uranium ore	*	*	*	*
Salt	Mt	4,390	000 t	2,249
Nonmetallic substances	Mt	308	000 t	1,064
Useful rocks:				
• Ornamental	Mt	80	000 m <sup>3</sup>	21
• Sand and ballast	Mt	1,250	000 m <sup>3</sup>	31,326
• Others	Mt	9,789	000 t	1,064
Underground waters:	Mt			
• Heat from the hydrogeothermal systems	000 tcc	3,820	Gcal	99,773
• Geothermal waters	m <sup>3</sup> /day	22,612	000 m <sup>3</sup>	2,789
Spa waters (therapeutic mineral waters)	m <sup>3</sup> /day	82,621	000 m <sup>3</sup>	4,265
Natural mineral waters	m <sup>3</sup> /day	37,326	000 m <sup>3</sup>	1,253

In Romania varied ore deposits has been exploited from the earliest times, gold, copper, lead, zinc, manganese, iron and salt having been worked extensively. Archaeological evidence suggests that there has been mining in Romania for thousands of years, with artifacts from various ages having been shown to have been made from locally produced metals and minerals. Ore production became better organised during the Roman period, while simultaneously processing techniques became more diversified.

The most productive mining centers with classical metalliferous ore deposits (containing gold, silver, lead, zinc, copper, iron and manganese) are located in Neogene volcanic zones in the Metaliferi and Oas-Gutai Mountains, and in the Banat region and in the Bihor massif related to Upper Cretaceous-Paleocene intrusive structures, as well as in the East and South Carpathians in the Poiana Rusca massif, or in Dobrogea, the latter related to Palaeozoic or older metamorphic rocks. [5]

In Romania, a national strategy for the mining industry was drawn up. [6] The useful mineral substances on which the strategy is focused, are as in table 1.

Other important minerals can be found in very small quantities or have not been discovered yet (table 2).

Table 2. Critical raw materials important for the competitiveness in the EU

Metal/Mineral	Existing in Romania	Potential to be discovered in Romania
Antimony	No	Low potential
Beryllium	Yes	
Cobalt	No	
Fluorine	No	
Gallium	No	
Germanium	No	
Graphite	Yes	
Indium	No	
Magnesium	Yes	
Niobium	Yes	
Platinum group metals	No	
Rare earths	No	
Tungsten (Wolfram)	yes	

**3.2. SWOT analysis of the situation of the raw materials in Romania.** There are a lot of raw materials exploited in Romania, such as: hard coal, lignite, salt, nonmetallic substances and useful rocks, mineral waters, polymetallic ore, gold and silver ore, copper, uranium ore, but they have some common strengths, weaknesses, opportunities and threats.

**Strengths:**

- significant deposits
- good infrastructure
- qualified personnel
- long tradition in mining
- coal has an important contribution to the energetic security of Romania in case of crisis of other resources
- salt, nonmetallic substances, useful rocks mining has an important contribution to the state budget
- in some cases, modern technology

- some modern preparation plants
- efficient in cases of surface mining, salt and mineral waters

**Weaknesses:**

- difficult underground conditions
- low calorific power for coal
- old technology
- metallurgic activity has restrained or ceased activity
- high personnel costs
- high production costs
- low degree of mechanization for underground mining
- high impact on the environment due to the surface mining
- personnel overaged

**Opportunities:**

- increasing need for raw materials
- demand for coal on the energy market
- ongoing mining has a positive economic impact on the population
- neighbouring countries have no salt deposits (except Ukraine)
- high quality of mineral waters, attractive for investors

**Threats:**

- aggravation of the world economic crisis
- increase of the production costs due to safety and environment regulations
- lack of a regulated price close to the production costs
- social vulnerability
- dependence to the power plants
- competition on some external markets for salt
- imports for mineral waters
- possible financial difficulties due to the beneficiaries
- shortage of funds for investments

**3.3. Strategic objectives of the mining industry.** In the Strategy for the Mining Industry for the years 2012-2035 there are stated the objectives for the following years.

There are some general objectives and based on them there are objectives specific for the relevant domains. [6]

The general objectives of the Romanian mining industry are:

- Ensuring the mineral resources for the sustainable development, especially from internal production
- Conformation of the national needs with the need for capital for investments and the requirements for sustainability
- Getting into the economy of as high and various mineral resources as possible
- Reducing the dependence to imports of primary energy resources and mineral raw materials

As far as the research and development are concerned, the objectives aim at the invisible and intelligent mining, automation of processes, efficient use of materials, water and energy. In addition, the gas emissions are to be reduced, chemical and biological processes for enrichment will be used. For the survey, multi-dimensional systems of data and modelling will be used. The metals will be extracted and processed in high-tech processes, but at the same time recycling and use of new, alternative materials are desired. Last but not least, environment management and assessment are part of the strategy. As far as the production is concerned, the main objectives are to maximise the economic efficiency, regulation of the informal and formal, artisanal and small scale mining, transparenence in the international commerce with mineral raw materials (including new technologies, prices, markets) and the complete cycle: mining – transition – post-closure.

## 4. CONCLUSIONS

In the international circumstances, ensuring the energetic independence and the necessary of raw materials is very important.

Thus, the dependence to external suppliers is reduced or – ideally – energetic independence is achieved.

Of course, mining should not be done at any cost. New, more efficient technologies must be used in order to increase the cost-effectiveness of mining and also to protect the environment, according to the principle of sustainability (Nachhaltigkeit), stated by Hans Carl von Carlowitz in his work *Sylvicultura oeconomica* in 1713.

On the other hand, due to the strategic character of the resources, principles of effectiveness cannot be applied in mining just as in other industries.

Mining (together with agriculture, forestry and fishing) belong to the primary branch of economy, base for all other branches, and therefore in some situations even subsidies are legitimate.

A sustainable national economy needs an intelligent management of the domestic resources, and that means mining.

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