OMENTIN - information network about mining and environmental technologies

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The European mining industry faces increasing challenges to meet the environmental requirements and to convince the local communities over the need and benefit of its existence. Communities and residents near mine sites have increasing concern over the use of the different mining and processing technologies. They need to know the scientific background of these technologies ,their impact on the environment and the risks involved. This information, which normally comes from authorities, companies should be detailed, simple, transparent and unbiased. To access the public and provide them with such information. improved techniques and multinational network are needed. In this network mining professionals and environmentalist should find common language and platform to discuss the benefits and hazards of mining and formulate joint opinions.. The OMENTIN projects aims to establish and develop this platform, and attempts to develop.

Key words*: ore mining, sustainability, environment, Carpatho-Balkan, information*

Introduction

One of the most traditional industries in Europe is ore mining. This is especially true to our region, the central-Eastern Europe, where the mining tradition goes back to the Roman times. Ore mining exploits mineral resources. Mineral resources may create wealth for communities. The exploitation of mineral resources may also cause environmental problems and risks. The utilization of these resources thus has to be evaluated from both the economic and environmental point of view. To exploit or not the mineral resources, it is linked to the question whether the risk is acceptable or not, i.e. if this activity brings hazards to human or natural environment.

No human society of developed countries may live without the use of metals, which surround us in the form of widely diversified products, from cars to CD players. The growing use of metals runs parallely with the growing concern regarding environmental impacts of ore mining, and tendencies to restrict or completely ban this industry. Our view is that ore mining should be sustainable in the long-term future the use of metals in different products which are considered as necessary for our life. The rendering the European ore mining unsustainable would restrict our metal consumption based on imported raw materials and simply export the environmental impacts of ore mining to the developing countries of other continents.

The participants and objectives of the OMENTIN project

Mining accidents damage the environment but also initiate efforts in technological developments to increase the safety. The Baia Mare accident in Romania and the Aitik accident in Sweden in 2000 have shown that accidents do occur irrespective of the development level of the mining industry. These accidents were a starting point of a new initiative to make technical information more understandable and available for the wide public. This initiative has come from different countries of Europe and finally has been transformed into a project, which has won the support of the European Commission.

The OMENTIN (Ore Mining and Environmental Technologies Information Network) is a 3-years project in which mining professionals, geologists and environmentalists work together in assessing, evaluating and explaining hazards linked to ore mining.

The project was started after the Baia Mare and Borsa and Aitik environmental mine accidents. The initial participants in the project are:

Geonardo KFT	Engineering and consulting company	Hungary
CENTEK	Research and development company	Sweden
University of Leoben	Institute for Oekosystem Analysis	Austria
University of Baia Mare	Department of Geology and Mining Engineering	Romania
Regional Environmental Center	Environmental foundation	International

The personnel of the teams are geologists, mining professionals, media experts and environmental scientists. They monitor, collect and interpret mining related data. Omentin aims to establish the cooperation of environmental and mining experts enhancing the objectivity of the information.

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The first step of the program is to assess the state of the art in the European mining industry and mining waste management. The traditional methods, open pit mining, underground mining and leach mining are the main alternatives for the extraction of ore. In several cases a combination of two methods was used during the lifetime of a mine. The largest European underground operations produce about 10 million tones per year. Open pit operations reach the 20 million tonnes mark. Most of the ore mines in Europe are small by world standards.

While several of the European ore mines use traditional ore processing facilities, the newly opened mines are equipped with the best available technologies. There are basic elements of ore processing as comminution, gravity and magnetic separation, flotation, biological oxidation, leaching, other solvent extraction methods, roasting. The different processing routes are built up from these basic components. Base metals mines in Europe use the traditional grinding-flotation technologies; the leaching and solvent extraction methods are not used extensively. Many of the former uranium mines have used some version of the leaching extraction.

There are traditional mining centers (like Rio Tinto in Spain, Cornwall in England, Erzgebirge in Germany, Garpenberg in Sweden, Banská Štiavnica in Slovakia, Rosia Montana in Romania, Majdanpek in Yugoslavia, etc.), which are in operation for several centuries or several thousands of years. The central parts of Europe play a minor role in the present mining industry. The weight at present is on the northern (Sweden, Finland), eastern (Bulgaria, Romania) and western (Spain, Portugal) peripheries. Despite the regulations regarding new mines are more stringent, several important projects are in the development stage in Sweden, Finland, Romania, Bulgaria.

In the first step, the whole present European mining industry has been reviewed and data from the ore mines which were (or still are) active in the last 15 years, i.e. from 1987 to 2002 collected. An easy-to-use database is built up from these data, which contain and exhibit these data by countries and commodities.

A review of environmental regulations, as a second objective, helps to understand the legal and social aspects of these technologies. Several technical and legal preparatory works are going on in the EU to provide regulations and recommendations for the mining waste management and safe mine closures. Our project creates an actualized source of information about these recommendations.

The third part of the work program deals with the public awareness towards mining science and technology. The European public is concerned about the vicinity of mines, hazard potential of ore processing, and unforeseen consequences of mine closures. The raising of public awareness is needed to understand industrial techniques, to accept its existence in our surroundings and to enforce the mitigation of their environmental effects. It also means a preparedness to deal with the problem if it occurs. The raising of public awareness may mean the enforcing of safe and clean mine techniques while understanding and containing their potential danger to the environment. It also means the permitting of mining activities and requiring assurances to safe and environmentally acceptable modes of their final closure.

The final part of the work program covers the evaluation of the Baia Mare and Aitik accidents. The evaluation aims to revise the consequent measures rather than the causes of the accident, which were studied in details previously by other groups. (Bergström and Bodo, 2001).

Tools, working methods used by OMENTIN

During the OMENTIN programme, several forms of media is tested to disseminate the mining and environmental technology information. The scientific evaluation and assessment of mining data is our basic method of data acquisition. Information is collected and systematized from public sources, publications, internet releases, scientific studies. Main parameters are selected and compared to characterize the size and type of mining related hazards. The data are unified for the classification and analysis.

The Internet website of the project. www.omentin.org is our most important tool to publish information. The site is active and periodically updated since the starting date of the program, May 2001. The main pages of the web-site are now also translated into national languages.

A newsletter is published periodically (2-4 times a year). In the Newsletter, the ongoing events, information about the progress of our work, new contacts, etc., are given. The newsletter is now issued in growing number of national languages and distributed electronically among the environmental groups and mining professionals in growing number of countries.

The database of active ore mines, OREMINE, has been compiled and attached to the website. This database includes basic data about all European ore mines. The geographical location, main mineral commodities, production figures, mining methods, processing technologies are the main entries of the database, which includes the data of ore mines which were active, closed or opened in the last 15 years period.

On-line workshops are being organized on the Internet. This tool serves to discuss events, which are actual, like the publication of the Cyanide Code for the mining industry. It is planned to increase the use of this tool since the Internet is the most common media available to the public in a cheap and effective way.

Technical publications are prepared which review the ore mining industry, waste management methods and environmental regulations related to mining. The first of these reports was completed in May 2001, and gave a

cross section of the industry titled "Ore Mining, Processing and Waste Management in Europe". The report is targeted to the technically educated public, but with no geological or mining training. It also serves as information to journalists. The reports are downloadable from the Internet.

Using these sources as a background, popular science publications are written and released helping to understand several mining terms as well as risks and hazards related to mining. "Ore mining – with or without" is the title of our first release. The publication is also downloadable from the website.

Workshops are planned to train environmental NGOs about mining related environmental risks. The first of such workshops is planned to be held in 2003.

Our final objective, and possibly the most powerful tool is the growth of the network. Since its start new partners joined us from Norway, Turkey, Czech Republic, Romania. We are inviting other partners who have an intention to participate in our activity. Still, there is a lot to do to convince environmental organizations about the usefulness of the contacts, which can be built through this network. The gap created by the lack of information and lack of confidence can be closed gradually by supplying a clear and understandable information. On the other hand, environmentalists cannot be unaware of societies' needs, which finally maintain the production of mines. We believe that our work, by transforming scientific data into information to wide public, which assist both sides to hammer out a working compromise.

Sustainability of ore mining in our region

The ore mining still has a significant share in the national economies of Yugoslavia, Bulgaria, Macedonia, Albania, and Greece. The Carpatho-Balkan region has an outstanding ore resource potential in the European continent, with large-scale exploration projects in Romania (Rosia Montana Au, Rosia Poieni Cu), Greece (Sappes, Viper, Au), Bulgaria (Krumovgrad, Au).

The sustainability means to exploit the resources without damaging the living environment and opportunities to access to the natural resources. Both ends of this sentence are important. The exploitation of natural resources is not a pure economic question. Instead, a complex of environmental, social and technical questions have to be answered positively allowing the thinking on the economy of a successful ore exploration project.

The Central-Eastern European countries are facing an important decision as to their mining industry. The maintaining of mining industry is possible only if methods and management techniques are revised and updated. When arriving to the question of preserving our water reserves and natural habitat from irreparable damages caused by large scale mining accidents, the decision should be obviously to restrict mining. The introduction of stringent quality assurance methods during the production, the replacement of the out-fashioned mining and processing equipments are the technical pre-requisites of the future environmental sustainability of ore mining in our region.

The openness and public release of all relevant environmental information are another requirements to achieve the social and political acceptance of ore mining. This is perhaps a harder and more time-consuming task than solving technological problems.

Mining engineers and ore geologists can play an important role in solving the technological, environmental and social problems. Our experience, which is an alloy of earth sciences and engineering technologies, could serve as a tool to create a common language for technologies and environmentalists in a conflict over mining issues.

Abandoned waste dumps, marginally economic mines, and new installations in old infrastructural environment had to face with growing requirements of the environmental and natural protection. A neglect fullness to these requirements resulted in a growing number of environmental accidents (like Baia Mare, Borsa in Romania, 2000), and latent pollutions (like Velez smelter, Macedonia, 2001). The environmental accidents triggered continent-wide protests and campaigns affecting not only the plants in question but also the whole industry.

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