

BioMinE

Biotechnologies for metal bearing materials in Europe

BioMinE is an Integrated Project in the Sixth Framework Programme that will allow the integration of innovative biotechnology based processes for recovery or removal of metals from primary materials (ores and concentrates), and secondary materials (mining wastes, metallurgical slags, metal bearing scrap, power plant ashes, etc.). BioMinE has officially started in November 2004 and will be operational as a European project in the Sixth Framework Programme until the end of 2008.

BioMinE Project description

The introduction of biometallurgical processes will lead to substantial improvements for metal production by increased recovery, reduced costs, reduced energy demands, increased revenue, and new resources.

Biometallurgy has the potential for a major technology breakthrough for the metals and minerals industry. This is underlined by the great interest shown by major international companies for this new technology.

The ultimate objective will be the establishment of environmentally friendly biotechnologies which are economic particularly at a small scale and will provide an alternative to current conventional technologies.

The anticipated breakthroughs under the RTD programme will be commercially evaluated through integrated piloting of the new processes together with preliminary economic assessments. This will provide a sound basis for decisions by industrial companies on whether to then proceed to commercial demonstration. The work will be enhanced by Educational activities.

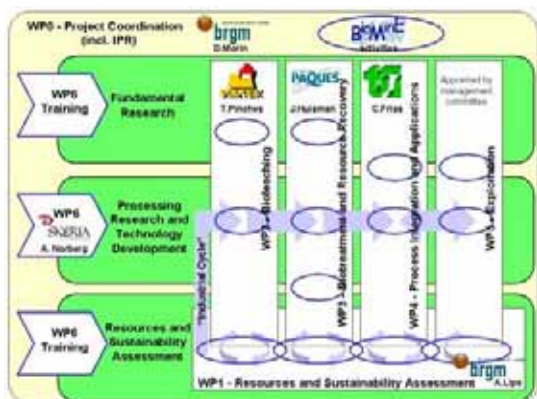
Management Committee

- WP0 - Management (BRGM - D.Morin)
- WP1 - Resources and Sustainability Assessment (BRGM - A. Lips);
- WP2 - Bioleaching (MINTEK - T. Pinches);
- WP3 - Biotreatment and Resource Recovery (Paques - J. Huisman);
- WP4 - Process Integration and Applications (Tecnicas Reunidas - C. Frias);
- WP5 - Exploitation (Management Committee);
- WP6 - Training (Skeria - A. Norberg), and
- Governing Council Chairman (Luleå University of Technology - E. Forsberg)



BioMinE Highlights

- Project website for internal and external use
- Database establishment on primary and secondary resources for biotechnological metal extraction
- Bioleaching amenability studies of concentrates & ores, novel & improved process configurations, and production of bioleaching end-products
- Bioleaching amenability studies of tailings and metallurgical / industrial wastes and co-processing of waste, dusts & ash.
- Microbial cultures from normal and extreme mining-related environments and assessment of potential use in metallurgical applications
- Sustainable use of waste solid products from bioleaching processes
- Molecular biology tools for detecting, identifying & monitoring bioleaching microbial systems.
- Microbial genetics of common mesophilic and moderately thermophilic bioleaching bacteria
- Prospecting for designing & controlling bioleaching microbial consortia to achieve advantageous process reactions
- Establishment of a proteomic approach applied to key bioleaching micro-organisms.
- Microbial transformation of silicate minerals
- Characteristics of microbial communities in AMD-affected area's
- Alternative electron donors for sulphate reduction and on sulphide oxidation by photonic bio-activity
- Expected mass flows and samples of the solids produced by the effluent treatment techniques
- Assessment of the viability of the bioflotation and bio-coagulation processes
- Ecotoxicity studies of biotechnological and classical effluent treatment
- Working prototype of continuous ecotoxicity measurement device using laser light
- Bioreactors and associated equipment design
- Progress report on lab-scale process experimentation in batch conditions
- Conceptual design and evaluation of developed biometallurgical processes
- BioMinE market definition and segmentation
- Preliminary exploitation and dissemination Plan
- BioMinE training plan (including technical standards and evaluation methods)
- Ten digital case-based learning objects



Project Organisation

The participants come from many EU member states, candidate and associated countries, and those countries with which there are special arrangements. The Project will have a strong management structure, with a General Coordinator and 6 Work Package Coordinators delegated by the Governing Council, uniting all partner organisations and the European Commission. Issues relating to IPR will be covered by an IPR Committee as part of the overall Project Coordination.

BioMinE Coordination team

- Dominique Morin** - General Coordinator
 - Andor Lips - Assistant to Coordinator
 - Patrick d'Hugues - Assistant to Coordinator
 - Hélène Serra - Project Assistant
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<http://biomine.brgm.fr>

Partner consortium

At the start of the project the BioMinE consortium includes the following organisations: The **DG Research**, European Commission; **BRGM**, France; **Hellenic Copper Mines**, Cyprus; **Tampere University of Technology**, Finland; **Technische Universitaet Berlin**, Germany; **Universitaet Duisburg-Essen**, Germany; **IGME**, Greece; **National Technical University of Athens**, Greece; **Bioclear B.V.**, the Netherlands; **Paques B.V.**, the Netherlands; **Wageningen University**, the Netherlands; **Instytut Metali Niezależnych**, Poland; **Instituto Nacional De Engenharia Tecnologia e Inovação**, Portugal; **De Beers Consolidated Mines Ltd**, South Africa; **MINTEK**, South Africa; **University of Cape Town**, South Africa; **University of Stellenbosch**, South Africa; **Universidad Autonoma de Madrid**, Spain; **Luleå University of Technology**, Sweden; **MEAB Metallextraktion AB**, Sweden; **Umeå University**, Sweden; **CellFacts Instruments Ltd**, United Kingdom; **Greenwich Resources plc**, United Kingdom; **Imperial College of Science & Technology**, United Kingdom; **Rio Tinto Technical Services Ltd**, United Kingdom; **University of Wales, Bangor**, United Kingdom; **University of Warwick**, United Kingdom; **Tecnicas Reunidas S.A.**, Spain; **Outokumpu Research Oy**, Finland; **Umicore**, Belgium; **Skeria**, Sweden; **CNRS**, France; **Universitaet Stuttgart**, Germany; **PE Europe GmbH**, Germany; **Institute for Nonferrous and Rare Metals**, Romania; and **Milton Roy Mixing**, France.

The consortium welcomes other organisations to become associated to BioMinE.