

Luleå. Sept 17, 2010

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## Response to Raw Materials Initiative - Public Consultation

SveMin, Swedish Association of Mines, Mineral and Metal Producers, delegates the R&D issues to MITU, Swedish Mining Research Foundation ([www.bergforsk.se](http://www.bergforsk.se)).

We appreciate the opportunity given to provide our comments to the coming Communication and in case further information is requested we are happy to provide more details. This reply has been prepared in consultation with the Swedish mining industry and Luleå University of Technology.

In response to the Public Consultation on the preparation of a new Communication on Raw Materials (see [http://ec.europa.eu/enterprise/policies/raw-materials/public-consultation/index\\_en.htm](http://ec.europa.eu/enterprise/policies/raw-materials/public-consultation/index_en.htm)) MITU/Bergforsk here provides our comments concerning “POLICY AREA: PROMOTING SKILLS AND RESEARCH, DEVELOPMENT AND INNOVATION”, questions 19, 21—26

### Regulatory framework conditions inside the EU

*19. Do you consider it useful to establish an EU geological service based on a network of Member State geological services.*

It is of paramount importance to create PAN-European geoscientific databases that are consistent and transparent with a common structure to permit inter-disciplinary integration of data over the country borders. Such databases will increase the possibility to find new sources of supply within EU. The Member States should try to achieve this in the most efficient way.

### Skills:

*21. What type of actions would you propose to provide better cooperation between companies, universities and public authorities in order to promote skills and in the extractive or other raw materials sectors? Please specify.*

MITU is the industry-driven vehicle in Sweden to foster co-operation between companies, universities and public authorities. The mining industry has selected Luleå University of Technology (LTU) ([www.ltu.se](http://www.ltu.se)) as the main university for co-operation in the pertinent research necessary. Public bodies view the ongoing successful industry - LTU co-operation as a good model for other industries as well.

The industry needs R&D in a suite of areas: mining economics, exploration, extraction, beneficiation, metallurgy, transports, energy and all environment issues related to exploration, extraction, mineral processing and smelting.

To further enhance fruitful co-operation, long-term (financial) commitments (> 10 years) are necessary, both from industry, the university and the public bodies. Private Public Partnerships (PPP) seems in that respect to be a step in the right direction.

*Research, Development and Innovation:*

22. Are you aware of any research, development and innovation programme(s) at national, regional or local level? Please specify.

Sweden is presently running a Strategic Mining Research Programme in an agreement between the Swedish Agency VINNOVA and MITU. The focus areas are:

- Securing the supply of raw materials through exploration
- Improved competitiveness through development of production technology
- Increased knowledge in particle technology in mining industry processes
- Resource-efficient extraction of base metals
- Reduced environmental impact in mining operation

Currently 11 projects are funded. The government spend around €5.4 million and the industry > €5.5 million on these projects during 2007-2011.

Besides this public funded programme, the industry is running programmes through the MITU subsidiary Rock Tech Centre ([www.rocktechcentre.se](http://www.rocktechcentre.se)). One example is the commercial consortium created to develop ground support systems and equipment for deep mining with an impressive number of participants from European and global mining companies and global suppliers. Here we also find partners from the global construction engineering sector as well as one nuclear waste management agency.



Luleå University of Technology recently created the Centre of Advanced Mining and Metallurgy (Camm) with direct annual long-term funding (around €2.2 million) from the Ministry of Education and Research in Sweden. The coupling between the national initiatives and the European programmes e.g. through the ongoing FP7 projects in Europe, such as the ProMine (€18 million) endeavour is of paramount importance.

Since several years, the mining industry is co-operating with other primary industry sectors to develop sensors and "process-IT", through the LTU research centre ProcessIT Innovations ([www.processitinnovations.se](http://www.processitinnovations.se)). Recent activity within this centre is to create a ProcessIT Europe network within the ARTEMIS technology platform ([www.processit.eu](http://www.processit.eu))

Further promoters of research in mining in Sweden are e.g. Georange ([www.georange.se](http://www.georange.se)) and Bergskraft ([www.bergskraft.se](http://www.bergskraft.se)) with important environmental research activities mostly funded through the regional EU Structural Funds.

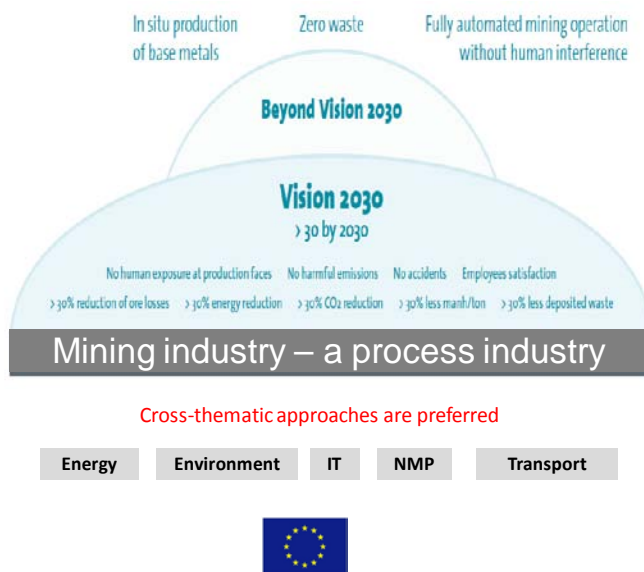
23. Where do you see the major gap / the urgent need for the raw materials sector related research, development and innovation at EU level. Please provide details.

There is still in Europe a general view that we cannot extract more from our domestic sources. We do not share this view; there are many examples from many parts of Europe that investments in exploration identify new European mineral resources. A much better understanding of the European resources in 3D is required, not only to reduce the import dependence of metallic raw material but also to provide a better base for policy and decision making on land use issues.

The recently released report on “Critical raw materials for the EU” by the *ad-hoc* Working Group of the Raw Materials Supply Group chaired by the European Commission, lists 14 commodities which are critical to EU, partly based on the import dependence. It is our firm belief that by research in exploration would identify previously unknown EU resources on most commodities.

We should also acknowledge that the word “mineral” can not be found in the FP7 or in any accompanying Specific Programmes and hence that it much work still is needed to initiate research, development and innovation (RDI) within the European Programmes. It is vital that the sector receives full recognition in FP8.

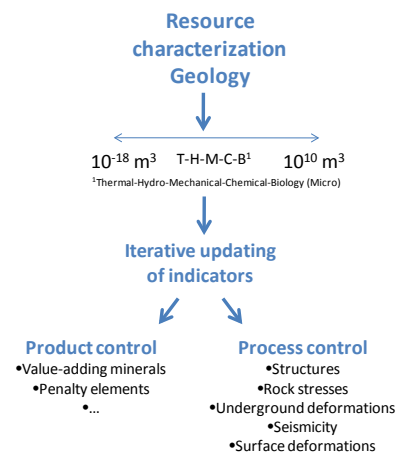
The metal mining industry is a high-tech process industry and in general we have the same needs as the process industry. With respect to the production system we would like to be safer, leaner and greener and an attractive workplace for young men and women. In the ongoing Mine of the Future programme in Sweden we have selected a number of targets for the future industry, see the picture below.



In order to increase safety we need technology to achieve zero-entry to the production areas. For a greener environment we need to cut energy and CO<sub>2</sub>; hence we need new types of engines for the vehicles, based on e.g. fuel cells or batteries rather than diesel, we need fundamental research in breakage mechanism to make continuous mechanical excavation possible in hard rocks as well as find the means to reduce energy consumption in grinding. For green mining we need to solve the Acid Rock Drainage problem generated from sulphide ore extraction. For leaner production much improved equipment reliability is necessary.

All the current and future challenges call for integrated approaches, where e.g. IT is used to cut energy and emissions. Therefore we are very positive to the recent proposal to create Process IT Europe as a centre with the ARTEMIS platform. We are in favour of co-operation with other industrial sectors where deemed beneficial at the same time recognising the specific needs of this sector.

Of particular importance is to develop the tools for product and process control through better methods for resource characterisation of the mining sites, see the adjoint figure.



Focussed RDI on “geo-metallurgy” and resource characterisation would further increase ore recovery, provide cleaner products to the market and maximise the inherent values of the mineral resources; efforts in these areas would also contribute to increased occupational safety and higher energy efficiency. Such research would likely benefit from collaboration with organisations involved in exploration of oil and gas, construction and final disposal of CO<sub>2</sub> and nuclear waste. For nuclear waste disposal, the responsible organisations have already spent billions of € to develop and apply methods for resource characterisation and they also recently launched the technology platform Implementation of Geological Disposal ([www.igdtp.eu](http://www.igdtp.eu)) supported by EURATOM.

We should also note that the mining industry is a big transport customer as well. The mining company LKAB for example transports 35% of the good on the Swedish railroads (ton·km)

A general topic for studies, concerning all industrial technologies, is to research, develop and innovate successful methods to transfer the RDI results on production processes and new products into full implementation in practice; only by transferring theories into practice we generate the necessary sustainable competitiveness.

24. What is your idea of a major research and innovation action that would have the highest positive impact on the security of raw materials supply for the EU industries? Please specify.

Three actions are necessary:

1. Sustained R&D in exploration to find new resources and to reduce the import dependence of the EU economy.

2. Transparent and logical R&D programmes to maintain the existing global technological leadership of the mining companies and the global European equipment suppliers. Many of these companies do not participate in EU-programmes for reasons of bureaucracy and protection of Intellectual Property Rights (IPR).
3. R&D in systems to increase recycling and recovery. Such systems are not only in technology but also in innovation of systems for logistics, taxation and incentives etc. Sweden e.g. shows good results in recycling of paper, cans and PET bottles.

*25. Are you aware of innovative exploration and extraction technologies, where project partners on a European level are needed to develop and implement the new technologies and which are the innovative technologies which need to be developed further. Please provide details.*

The challenges and the changes are so large and numerous that a comprehensive international cooperation is needed both within and outside the mining sector. Some details follow: deep-penetrating geophysical exploration methods, 4D modelling of mineral belts, on-line assaying of grade control, continuous mining in hard rocks etc.

See also the answer to issue 23 and 24.

*26. Are there any other aspects related to skills, R&D and innovation for other raw materials, such as wood, that need to be further promoted? Please, specify.*

Swedish mining industry and pulp and paper are already co-operating on e.g. sensor development through the triple-helix organisation Process IT Innovations ([www.processitinnovations.se](http://www.processitinnovations.se)). We are both part of the process industry and as such would benefit on RTD programmes on e.g. IT, automation, energy efficiency, environment and transportation.

Yours sincerely



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