

Public Consultation on the preparation of a new Communication on Raw Materials

Reply from BRGM, the French Geological Survey

Objective

The Commission intends to adopt a Communication on the subject above by end of this year. It will highlight the recent economic developments on the global raw material markets, show the progress made in the implementation of the Raw Materials Initiative (adopted in 2008), but also highlight remaining challenges and draw conclusions in terms of the way forward.

The goal of this consultation is to gain an understanding of stakeholders' views on both the implementation of the Raw Materials Initiative (RMI) as well as gather opinions and suggestions on the potential avenues the Commission should explore in order to further progress and strengthen the Initiative, including actions at the level of EU, Member State and/or other stakeholders to address the key issues in relation to non-energy raw materials. For the purpose of this consultation "raw materials" cover all industrial raw materials including materials such as minerals, ores, aggregates, and also wood, hide and skins and other industrial raw materials with the exception of energy and food related raw materials.

State of play

In November 2008 the Commission adopted the Communication (2008) 699 "The raw materials initiative - meeting our critical needs for growth and jobs in Europe" which proposed an EU integrated strategy as a response to the different challenges related to access to non-energy raw materials. As such it tied together various EU policies, both external (e.g. external relations, trade, development) and internal (e.g. environment, competitiveness, innovation), and promoted further cooperation between the Member States where appropriate. The proposed strategy is based on 3 pillars:

1. ensure a level playing field in access to resources in third countries
2. foster sustainable supply of raw materials from European sources, and
3. reduce consumption of primary raw materials by increasing resource efficiency and promoting recycling.

In May 2009, the Competitiveness Council endorsed the major objectives set out by the RMI and invited the Commission, Member States and stakeholders to act swiftly in the implementation of various lines of action outlined by the RMI. It also welcomed the Commission's intention to report back on the implementation of the RMI by the end of 2010.

The launch of the RMI coincided with the full onset of the financial and economic crisis. The evolution of the international raw material markets has confirmed the structural nature of the issues at stake and thus reinforced the need to further pursue the objectives of the RMI.

Meanwhile the RMI has gathered extra momentum with adoption of the Europe 2020 Strategy that includes as one flagship "An industrial policy for the globalisation era" and that foresees the setting up of a framework for a modern industrial policy that will "address all elements of

the increasingly international value chain from access to raw materials to after-sales service". Other related flagships are "Innovation Partnership" and "Resource Efficiency".

Work is ongoing to implement the different lines of action outlined by the RMI. On top of a series of actions undertaken in the framework of the RMI, three major deliverables have recently been released:

- Report on defining "critical raw materials at EU level"¹;
- Report on "exchange of best practices in area of land use planning and permitting"²;
- Trade activity report 2009 on raw materials³.

Another one is the Guideline document on "Non-Energy Extractive Industry and Natura 2000" aimed to provide clarification. The Guideline document is foreseen to be published by end of July and will be also available via the web site of Environment Directorate General. Finally, regarding the external angle of the strategy, a first milestone was achieved with the publication of DG Trade's 2009 activity report on raw materials.

¹ http://ec.europa.eu/enterprise/policies/raw-materials/critical/index_en.htm

² http://ec.europa.eu/enterprise/policies/raw-materials/sustainable-supply/index_en.htm

³ http://trade.ec.europa.eu/doclib/docs/2010/june/tradoc_146207.pdf

QUESTIONS

POLICY AREA: DEFINING CRITICAL RAW MATERIALS

Major issues:

An expert group, chaired by Enterprise and Industry DG, recently released a report⁴ the presented a methodology to measure the criticality of raw materials at EU level. A raw material is labelled “critical” when the risk of supply shortage and their impacts on the economy are higher compared with most of the other raw materials. The report provides an analysis of 41 different minerals and metals, and concluded on a list of 14 critical raw materials. It also contained two sets of recommendations: recommendations for follow-up and further support, and policy-oriented recommendations to secure access to and material efficiency of raw materials.

Questions:

1. Do you have any comments on the methodological approach, including the scope, to determine criticality at EU level? If so, please specify.

Establishing a formal list of 14 minerals deemed as critical at EU level, may lead stakeholders such as policy makers, programme officers, NGOs, banks and the general public to think that there are no important criticality issues in relation with any other minerals needed to make the EU economies tick and click, whose production chain linking geological deposits to end uses may be disrupted by criticality issues. It would be better to name the 14 minerals list as the list of minerals with the highest criticality issues, just to make the above point clear.

Moreover, it must be stressed that several of the listed 14 minerals are essentially by-products of “main” metals, as shown by fig. 4 of the report. Their production is highly dependent on the production of main mineral substances such as aluminium, chromium, copper, nickel, tin or zinc, whose production and markets therefore need to be monitored as well, as there may be related criticality issues.

The fact that it is only on p. 18 of the report that the definition of criticality is given is not optimal. A framed box providing the definition at the onset of the report would be better.

2. Do you see any additional raw material that should be considered as critical? If so, please explain.

There are criticality issues related to a wide number of other minerals that need to be thoroughly identified, described and addressed. This should be the subject matter for a specific continuous “mineral intelligence” programme, as these issues evolve rapidly.

3. Do you have any comments regarding the recommendations of the report? If so, please specify.

3.1 - Recommendation 1 : The Group recommends that the list of EU critical raw materials should be updated every 5 years and that the scope of the criticality assessment should be increased.

BRGM considers that a five years time span is too long. Criticality issues may develop rapidly due either to :

- the policies of some rapidly developing nations (e.g. China, others may soon follow suit) that try to capture most of the production of a given commodity to the benefit of their economies ;
- the impact of financial speculation ;
- the impacts of technology shifts (e.g. the tantalum crisis in Central Africa in the late nineties, triggered by the rapid rise in the global demand for mobile phones and their microcapacitors based on the unique properties of tantalum) and of regulatory changes (e.g. the collapse of the demand for cadmium in the EU due to the toxicity of this metal and the regulations restricting its uses).

Mineral productions, trade patterns, players and their strategies, technology shifts need to be much more regularly monitored and the result of this compiled in the EU Mineral Yearbook suggested by the Working Group as part of Recommendation 2. Alert information should be circulated as frequently as relevant to industry and policy makers.

3.2. - Recommendation 2 The Group recommends that steps be taken to:

- improve the availability of reliable, consistent statistical information in relation to raw materials;
- promote the dissemination of this information, notably by preparing a European Raw Materials Yearbook with the involvement of national geological surveys and mining/processing industries. It should focus on improving the knowledge of the availability of resources and on their flow into products through the value-added chains of the EU economies;
- establish indicators of competition to land in the Member States;

It is unclear how the competition to land, where existent, can actually be measured through an indicator. Any piece of land (or indeed, square mile of sea) can be subject to many potentially conflicting claims, mining being just one among a wide range of possible land uses.

- encourage more research into life-cycle assessments for raw materials and their products on a “cradle-to-grave” basis;

“Cradle to grave” should be replaced by “cradle to cradle”, to promote the concept of a cyclical economy. Recycling should be actively promoted and developed across the EU economy, in line with the third pillar of the EU Raw Materials Initiative, as one of the means

to reduce the EU dependence on primary raw materials supplies. As a prerequisite to life cycle assessments (where the definition of a “function” in raw materials uses may be misleading), research on methodologies for mapping the flows and stocks of materials (including emissions) should be promoted both on the upstream side (physical statistical data) and downstream side (uncertainty analysis and reduction).

- create a working group(s) to further analyse the impact of emerging technologies on demand of raw materials.

With the exception of the above comments, BRGM agrees with the rest of the recommendations. An EU networked, public, minerals intelligence capacity, based on existing capacities, should be developed. It is remembered here that the US government consistently devotes a yearly budget of over 16 M\$ to support the USGS Minerals Information Team, that provides minerals statistics to the US government, industry, academia and to the general global public ; this is the prime public source of information about the global minerals industry.

The availability of better statistics is an important issue that would require trading houses and smelters being compelled to deliver their data against the guarantee that commercial information will be kept confidential. This is a complex issue requiring more work with the concerned parties, knowing that this would only make sense if progress can be obtained at the global scale, in line with the global nature of the mineral resources industry. Moreover, research is needed, together with industry associations representing the main users of minerals and metals, to develop an approach towards real consumption, based on statistical average minerals and metals contents of main traded semi and manufactured goods. The current international minerals and metals statistical system, based on apparent consumption, has severe limitations.

3.3 - Recommendation 3 - The Group recommends that a sub-group of the Raw Material Supply Group of the European Commission should be set up to ensure follow-up of this report on critical raw materials.

Due to the very complex issues related to critical raw materials, BRGM wonders what a goodwill working group based on occasional voluntary participation with no further resources could actually achieve. The Raw Material Supply Group seems to be sufficient to assist the Commission in monitoring and steering the process.

3.4 - Recommendation 4 - The Group recommends policy actions to improve access to primary resources aiming at:

3.4.1 • supporting the findings and recommendations resulting from the work carried out by the ad hoc working group on "Best practices in the area of land use planning and permitting" with a view to securing better access to land, fair treatment of extraction with other competing land uses and to developing a more streamlined permitting processes;

What “fair” here means is unclear. Who will decide on that ? The recommendations of WG II are not limited to the above points.

3.4.2 •promoting exploration and ensuring that exploration by companies is regarded as research activity;

Exploration is a highly risky activity that in most cases fails to yield a return. If it is to be supported by some sort of fiscal stimulus, this should be paid back in case of success, i.e. where the exploration activities yield an operating mine or where the exploration/ mining rights are transferred to a third party with a profit.

3.4.3 •promoting research on mineral processing, extraction from old mine dumps, mineral extraction from deep deposits, and mineral exploration in general, notably through EU RTD Framework Programmes;

The development of:

- a public, digital, geological, drill-hole, geophysical and geochemical 3D data infrastructure harmonised at EU level, focused on mineral rich regions ;
- the understanding of mineralising processes and the geological controls of ore deposits ;
- a pan-EU public life-cycle analysis / material flow database documenting the different production chains that yield the same raw material (e.g. copper is produced according to various production chains, likely to have different energy and water requirements, emissions and efficiencies) ;
- recycling / re-use technologies ;

need to be added to EU RTD programming in addition to the above mentioned topics.

In addition, characterisation of ore minerals (nature, size, geometry/ morphology, distribution, associations, quantification of valuable and penalising elements) and processing are the first technological steps of the production chain, where the grade/recovery (economical) compromise determines the losses of raw materials either not mined or lost in polluting tailings. Research is needed to optimise these steps from technological and economic performance as well as sustainable development points of view (better recovery and use of valuable resources, reduction of waste and emissions).

Research in product characterisation and processing is also needed to further develop the re-use or recycling of secondary materials (waste, end-of-life products).

3.4.4 •promoting good governance, capacity-building and transparency in relation to the extractive industries in developing countries, notably in the area of critical raw materials;

The reference to critical minerals should not be exclusive, as these issues refer to most known minerals.

Capacity building should come first, as mineral resources related institutions are needed by any State to promote, regulate and monitor the national mineral resources industry. Such institutions are very weak in many developing countries. Many developing countries producing mineral resources have a GDP per capita of less than 2€/ day. How can these be expected to run and properly staff institutions such as a geological survey, a directorate of mines, an environmental protection agency, these being the core institutions needed in any

country with a significant mineral potential or an existing minerals industry ? In this context, brain drain by private sector operators is a major issue, as administrations in developing countries cannot offer salary packages competitive with those offered by the mining industry. This negatively affects the development of the whole minerals industry, its governance and transparency. It also seriously weakens the capacity of those States to reap better benefits for themselves and to generate more added-value when they engage with foreign companies. A stable, predictable, transparent, efficiently implemented regulatory and fiscal framework is one of the two key conditions needed in any nation to foster the development of a mineral resources industry in line with sustainable development ethics.

The second key condition is the development of a reasonable (1:100,000 scale or higher) resolution digital, public, interoperable¹ data infrastructure to identify and describe the mineral potential and the geology of each country. Such an infrastructure not only serves the proper integration of mineral resources in land-use planning (see report from WG II : “Improving Framework Conditions for Extracting Minerals for the EU - Exchanging Best Practice on Land Use Planning, Permitting and Geological Knowledge Sharing”), it is also of great importance for groundwater resources management, energy, soil science, use of subsurface space and the mitigation of the impacts of natural hazards.

Hence, a long-term, dedicated, ring-fenced financing facility is needed as part of EU development cooperation instruments, such as the European Development Fund, to support institutional strengthening and capacity building in high potential or already producing developing countries. This fund, as suggested by EuroGeoSurveys, should be endowed with not less of 100 M€/ year over a period of 10 years, as a minimum. Ring-fencing of the funds, by means of a specific financing instrument, is needed to avoid that the many short-term pressing issues that developing countries face attract all financial resources, making it impossible to address the long-term issues related to the sustainable development of the mineral resources industry in developing countries.

Support to any country should be conditional to its commitment to transparency (for instance via the implementation of the Extractive Industries Transparency Initiative), good governance and sound environmental management.

Twinning actions between EU and developing countries sectoral institutions should be considered, as well as encouraging access to EU geological, mineral resources and mining related education. Please note that BRGM has recently created a new high-level school (ENAG or BRGM School) which aims at, *inter alia*, meeting the needs of such institutions.

The whole topic is a very sensitive issue as China rapidly develops its investments in the global mining industry, including in developing countries with no attached conditionalities, something that many African governments warmly welcome (see for instance the Africa Union newsletter titled: “China & Africa: Assessing the Relationship on the Eve of the Fourth Forum on China Africa Co-operation (FOCAC IV)”²).

¹ In line with the concepts and methods included detailed in the EU Directive

² Available for download from here : [http://www.africa-union.org/root/UA/Newsletter/EA/Fridays of the Commission/2010/AUC%20Vol1%20FF%20Low%20Res.pdf](http://www.africa-union.org/root/UA/Newsletter/EA/Fridays%20of%20the%20Commission/2010/AUC%20Vol1%20FF%20Low%20Res.pdf)

3.4.5 • promoting sustainable exploration and extraction within and outside of the EU.

This topic is addressed below.

3.5 - Recommendation 5 - The Group recommends that the following policy actions, with regard to trade and investment as defined in the trade raw materials strategy, be pursued:

- maintain current EU policy choices in the negotiation of bilateral and regional trade agreements;

The lack of a clear mineral resources component in the EU development policy is detrimental to the development of a level, sustainable, investment playing field for the global mining industry. It leaves the developing world in the hands of countries that, such as China, act in accordance with a different set of values and a different political agenda.

- consider the merits of pursuing dispute settlement initiatives at WTO level so as to include in such initiatives more raw materials important for the EU industry; such actions may give rise to important case law so long as existing GATT rules lack clarity and are limited in scope;
- engage without reservation in consultations with third countries whose policies are causing distortions on international raw materials markets in order to discourage certain policy measures and to request adherence with market forces;
- foster an effective exchange-of-views on certain policies made within the institutional framework of EU economic cooperation agreements (e.g. with China on the latter country's NFM recycling plan to year 2015);
- continue to raise awareness on the economic impact of export restrictions on developing and developed countries in various multilateral fora, such as WTO or the OECD;
- consider shaping a new EU-wide policy on foreign investment agreements in such a manner as to better protect EU investments in raw materials abroad and ensure a level playing-field with other foreign investors who benefit from the backing of State funds;

No comments on these five items.

- continue to increase coherence of EU policy with respect to raw materials supply, for example in the assessment of injurious dumping and subsidies.

Coherence in EU policy in relation with raw material supply issues is needed across many sectors like development, external relations, enterprise & competitiveness, energy, environment, maritime policy, regional policy, research and trade.

3.6 - Recommendation 6 - The Group recommends that policy actions are undertaken to make recycling of raw materials or raw material-containing products more efficient, in particular by:

- mobilising EoL products with critical raw materials for proper collection instead of stockpiling them in households (hibernating) or discarding them into landfill or incineration;

- improving overall organisation, logistics and efficiency of recycling chains by focusing on interfaces and system approach;
- preventing illegal exports of EoL products containing critical raw materials and increasing transparency in flow;
- promoting research on system optimisation, characterisation, quantification and recycling of technically-challenging products and substances, such as waste.

This should not be limited to critical minerals but to all mineral and mineral related commodities where, on the basis of sound LCI and LCA data a clear sustainable development benefit would occur from recycling. Research on the methods to assess this benefit should also be promoted.

3.7 - Recommendation 7 - The Group recommends that substitution should be encouraged, notably by promoting research on substitutes for critical raw materials in different applications and to increase opportunities under EU RTD Framework Programmes.

Yes

4. Are you aware of any initiatives in your country that aim to assess the criticality of raw materials? If so, please describe briefly.

On 27 April 2010 a Mineral Resources Action Plan was presented to the Council of Ministers by Mr Jean-Louis BORLOO, Minister of Ecology, Energy, Sustainable Development and the Sea, who holds responsibility for mineral resources. Its outline was made public by a communiqué. The action plan is built around the following topics:

- Enhance our knowledge about strategic metals, in order to assess possible criticalities;
- Enhance our geological knowledge by means of targeted exploration work;
- Develop new tools to facilitate the extraction and processing of strategic metals;
- Develop the recycling policy;
- Reinforce government action and appoint a high level Official who would be in charge of fostering the implementation of the Action Plan as well as developing a dialogue between the State and the industry on security of supply issues.

The full French language text of this communiqué is available here: <http://www.gouvernement.fr/gouvernement/les-metaux-strategiques>.

BRGM is formally appointed as one of the State organisations involved in this Action Plan.

5. The functioning of raw materials markets has not been dealt with. Do you think that further analysis of their functioning should be carried out? What actions should be proposed to increase their transparency?

This is a very important research topic that should bring together industry, international metals study groups, EuroStat, OECD, UNCTAD, national statistical bodies, academics and geological surveys. Several important issues need to be addressed:

- The protection of commercial secrets;

- The opacity of trading houses, quite often based in tax heavens ; they play an important role in the trade of “critical” minerals;
- The lack of reliable detailed statistics from China or Russia;
- The move from today statistics, that only describe “apparent” consumption, towards an approach of real consumption.

As the United States Geological Survey has a long track record of providing public mineral statistics and related information (“minerals intelligence”), cooperation should be developed to benefit from the US experience on above issues and data collection/ analysis.

6. Do you think that the EU should propose a system of stockpiling for the critical raw materials? If so, please indicate whether you consider it more appropriate to do this at Community or alternatively at Member States level

This is a national policy issue, and not a topic for a Geological Survey.

However BRGM wishes to provide the following opinions :

- This is a very complex question which requires expert work, with expertise in economy, industrial strategies, innovative technologies to be properly answered;
- Past international experience with stockpiles (US, South Korea, Japan, France ...) should be looked at by the Commission to understand what strategies worked, and which ones failed. A strategy for the management of an European stockpile may be very difficult to agree on as Member States may express different priorities (for instance, some may have a platinum transforming industry, while others may not) ;
- The Commission should assess the Japanese way of managing security of supplies issues, as the Japanese and the European Union share similar dependence issues. In Japan, the State established the Japan Oil, Gas and Metals National Corporation (JOGMEC). This state agency is endowed with a funding of several hundred million US \$ to run the « Joint Basic Exploration Scheme (JBES), whereby JOGMEC identifies junior companies worldwide with exploration projects for metals of particular interest to the Japanese economy. JOGMEC then proposes to co-fund their exploration activities against a share in the company that can then be transferred to a larger Japanese industrial group in case the exploration activities prove an economic orebody. In this manner Japan gains access to “stockpiles in the ground” a model that could prove interesting for the EU and/or some of its Member States. JOGMEC English language website: <http://www.jogmec.go.jp/english/index.html>

4 http://ec.europa.eu/enterprise/policies/raw-materials/critical/index_en.htm

POLICY AREA: TRADE

Major issues:

One pillar of the Raw Materials Initiative consists in developing a European external strategy in order to guarantee the sustainable supply of raw materials from global markets at undistorted conditions. In this, trade policy plays an important role.

DG Trade has recently completed its 2009 activity report⁵ on raw materials, which summarizes the progresses accomplished along the three axes of the trade raw materials strategy:

- Include, as appropriate, the relevant trade disciplines on sustainable supply of raw materials in bilateral and multilateral trade agreements.
- Identify illegitimate trade distortive measures taken by third countries and tackle them using all available instruments, including through bilateral consultations, the Market Access Partnership process or, if necessary, the WTO dispute settlement; while delimitating more clearly permissible exceptions for e.g. development purposes.
- Reach out to third countries to show that the question of sustainable raw materials supply is an issue relevant to all countries, developing or developed, resource-rich and resource-poor alike as the uncontrolled, unregulated multiplication of trade restrictions can lead to a generalized beggar-thy-neighbour policy detrimental to most countries; while recognising the importance of respecting internationally agreed rules on the subject.

Questions:

7. Do you think that the importance of trade is adequately reflected in the work carried out so far in the Raw Materials Initiative?

No opinion other than the reply to question 5.

8. Do you have any comment regarding the main findings of DG Trade activity report? What activities should be prioritised? Are there, in your opinion, additional activities not mentioned in the report which should be pursued in this strategy?

No opinion other than the reply to question 5.

9. Are you aware of any initiatives in your country that have one of the above goals in mind such as, for example, developing a raw materials diplomacy, or supporting companies to invest in third countries in the raw materials sector? If so, please describe briefly.

Please refer to the reply to question 4.

10. Are you aware of any initiatives in your country that have one of the above goals in mind such as, for example, developing a raw materials diplomacy, or supporting companies to invest in third countries in the raw materials sector? If so, please describe briefly.

This is a question to be answered by the French authorities.

⁵ http://trade.ec.europa.eu/doclib/docs/2010/june/tradoc_146207.pdf

POLICY AREA: DEVELOPMENT

Major issues:

The 2008 RMI Communication highlighted that development policies play a relevant role in at three 'levels':

- 'Strengthening States'
- Promote a sound investment climate that helps increase sustainable supplies of raw materials
- Promote sustainable management of raw materials.

In 2010, within the context of the EU-African Union partnership, the European Commission and the African Union Commission recently agreed to develop a bilateral co-operation in the field of raw materials and to work together, taking fully into account the Africa Mining Vision of February 2009 and the EU Raw Materials Initiative of December 2008, in particular on issues such as governance, infrastructure and investment and geological knowledge and skills.

Questions:

11. What specific actions would you consider most relevant needed in the following areas:

- **Good governance;**
- **Infrastructure / investments;**
- **Geological knowledge / skills.**

Please refer to the reply to question 3.4.4.

These are three pillars of sustainable mineral resources development, requiring simultaneous action, including protracted EU support. The "Africa Mining Vision" document jointly prepared by the African Union and the UN Economic Commission on Africa well describes the need to simultaneously act on these three levers.

From 1980 to 2000 the European Development Fund included a special financing instrument (SYSMIN) designed to stabilise the export revenues of ACP States particularly dependent on mineral resource exports. Its last tranche (1995-2000) was endowed with 575 M€ grant money, of which an important part was devoted to geological/ mineral resources data infrastructure development, capacity building and institutional strengthening activities in about 20 countries. Some of the related programmes are still active, although nearing their end. It would be interesting to read the conclusions of a detailed evaluation of EDF programmes, including SYSMIN, as they would be very useful to identify the scope of further action.

12. Regarding transparency, what measures do you believe the EU should take to foster revenue transparency in the mining industry in raw material resource-rich countries? What are your views regarding existing initiatives currently being taken in this area, namely by the Extractive Industries Transparency Initiative (EITI)?

Transparency, corporate social responsibility, observance of sustainable development ethics are needed to avoid the potentially very damaging consequences of an unregulated

<http://eiti.org/>

international competition only driven by national and/or corporate interest, not to mention illegal groups and activities. The EU, jointly with other countries, should actively continue to support the EITI and pursue an active raw materials diplomacy to persuade all key players on the global mineral resources markets to adhere to transparency principles, not only regarding financial flows but also raw materials flows. EU legislation should promote traceability and transparency regarding mineral resource flows into the EU economy, as well as meeting a minimum set of social and environmental standards in the mining and processing industries.

The roles of several agents that play a growing role on the global mineral markets, contributing to opaqueness and price volatility, decoupled from market fundamentals, will need to be assessed and, where necessary, properly addressed:

- the role of trading houses that buy and sell mineral commodities all over the world, especially the rarer ones, which are not traded on an exchange such as the London or the Shanghai Metal Exchanges (Bi, B, Co, Hf, Ga, Ge, In, Ir, Pd, Pt, Nb, Os, Re, Rh, Ru, Sb, Se, Sn, Ta, Te, Ti, Tl, W, V, Zr ...); while they play an important role in supplying raw materials from sometimes difficult to access sources their activities are not documented by statistics; several important trading houses are located in tax heavens and control important hedge funds;
- the role of increasingly sophisticated investment vehicles; while hedging plays an important role to secure the sellers or buyers of a mineral commodity with a reliable future price it is also a widely used speculative instrument; more recently exchange-traded commodities (ETCs) provided investors with a very convenient, and increasingly popular, way to speculate on specific commodities.

These vehicles act as powerful amplifiers of the market trends, and are likely to be the cause of the deep plunge, followed by a fast recovery, of mineral commodity prices observed in 2008 and 2009.

13. Concerning the recent agreement between the European Commission and the African Union Commission, in your view, what concrete objectives, targets and deliverables should be included in such a partnership?

Much work should be undertaken in partnership between the AU and the EU, with the support of experts in geosciences and the mineral resources industry, to provide a reply to the question raised here.

BRGM, having a very long experience of cooperation with developing countries in the raw materials sector, suggests that the first target should be to provide the African Union and RECs with technical assistance to help them design an all ACP and regional programmes to implement the Africa Mining Vision. Mineral resources related issues such as the need for infrastructures should be better integrated in the programming of the forthcoming EDF 11.

The evaluation of the EU-ACP cooperation financed out of past SYSMIN EDF 8 funds (1995-2000 funding tranche, implementation still ongoing in a few cases) would be very useful to undertake further programming.

The development of a digital, shared, distributed, interoperable public information system on Africa's geology, mineral resources, groundwater should be promoted. This should include with EU support to Phase II (the implementing phase) of the Africa-Europe Georesources Observation System (AEGOS); Phase I is currently funded as a Support Action under the 7th EU RTD

Framework Programme. This involves 23 partners, including 13 African partners (<http://www.aegos-project.org/>).

Capacity-building, institutional strengthening and geoscientific data acquisition should be financed and implemented in line with the chapter on mineral resources (Chapter 2.4) included in the Compendium on Cooperation Strategies that is appended to the EU-ACP Cotonou Partnership Agreement.

14. Do you consider that wood should be addressed in the framework of development policy? If yes, please specify what are the main issues to be analysed.

BRGM, having no expertise related to wood, cannot answer this question.

15. Are you aware of any initiatives in your country that contribute to promoting exploration and exploitation of mines in developing countries? Should such initiatives be better coordinated or promoted at the EU level?

In France this is a topic for the Ministry for Foreign and European Affairs.

POLICY AREA: IMPROVEMENT OF THE REGULATORY FRAMEWORK CONDITIONS INSIDE THE EU

Major issues:

The Commission has proposed in the Raw Materials Initiative adopted in 2008 to provide clarity on how to reconcile non-energy extraction activities in or near Natura 2000 areas with environmental protection. In consultation with stakeholders a guidance document has been finalised and will be available on the web site of DG Environment⁷ before summer break.

As regards ways to improve the regulatory framework within the EU by promoting the exchange of best practices in the area of land use planning and administrative conditions for exploration and extraction, a report has been delivered by the relevant ad hoc Working Group⁸.

This report covers the following topics:

- Minerals Policy
- Land use planning policy for minerals
- Authorisation and permitting procedures
- Achieving Technical, Environmental and Social Excellence
- Improving the EU's geological knowledge base
- Better networking between the national Geological Surveys
- Need to integrate terrestrial sub-surface information into the GMES Land Service

Questions:

16 Do you agree that these topics correspond to the major challenges in this policy area? If not, please specify.

Yes. There is also a need for a clear identification of a mineral resources (and downstream products) chapter in the EU research agenda. This should be addressed by the forthcoming 8th EU RTD Framework Programme, in order to further support the implementation of the Strategic Research Agenda published by the European Technology Platform on Sustainable Mineral Resources (www.etp-smr.org).

17. Do you think of any other avenues which should be followed by the Commission? If yes, please specify.

Please refer to statement under question 16.

18. Do you agree with the recommendations made in the report on "Exchanging Best Practice on Land Use Planning, Permitting and Geological Knowledge Sharing" or do you have any specific ones to be added. Please explain.

BRGM was part of the Working Group and supports its findings.

A substantial, protracted coordinated programme will need to be engaged by the European Commission and the Member States to develop the 3D digital geological/ mineral resources public knowledge infrastructure described in the report and in its recommendations. For cost and efficiency reasons, efforts should be targeted on areas with high potential for mineral resources. Considering that metallic minerals mines already go down to nearly 1,500 m in Finland and Sweden, that technologies will continue to be developed to address the issues concerning deep mining, and that a minimum 20 to 30 years timespan should be considered for such a programme, geological data supporting a gridded 3D representation of Europe's subsurface should target a depth of down to 3,000 m or more.

This programme will require public investments in geophysics (incl. airborne), geostatistics, geochemistry, drilling of deep scientific boreholes and modelling.

20 Do you consider that EU regulatory framework conditions for wood and/or recovered paper need to be further analysed? If yes, please specify.

BRGM, having no expertise related to wood, cannot reply this question.

⁷ <http://ec.europa.eu/environment/nature/natura2000/>

⁸ http://ec.europa.eu/enterprise/policies/raw-materials/sustainable-supply/index_en.htm

**POLICY AREA: PROMOTING SKILLS AND RESEARCH,
DEVELOPMENT AND INNOVATION**

Major issues:

- Promote **skills** not only in the mining sector but also in other raw materials sectors is a matter of concern. The Commission is currently supporting this challenge via programmes such as ERASMUS MUNDUS with the specific Minerals and Environment Programme (EMMEP).
- Focussed **research** on innovative exploration and extraction technologies, recycling, materials substitution and resource efficiency. The Commission has recognised the European Technology Platform on Sustainable Mining (ETP-SMR) to catalyse excellent research and development collaborative projects between the industry and research organisations. In addition, via the 7th framework programme for research, development and innovation the next call for proposals in the area are expected to be public in July⁹.

Questions:

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.

The EU could provide fellowships to make it possible for students from developing countries to attend mineral resources and geology related training programmes in EU universities and Mining Schools. The EU-wide training offer should be identified and made accessible from a single Web portal.

BRGM created its own higher education school, ENAG or BRGM School, to meet the requirements of the primary public and private actors in the fields of mineral resources (with a view to extending it to geothermal energy and geological storage of carbon dioxide). Its purpose is to train high-level specialists in geosciences (post-graduate level), able to take on operational or strategic responsibilities within mining companies or state organizations from various countries.

Research, Development and Innovation:

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

In France this is a topic for the Ministry for Higher Education and Research. It is the authority in charge of research, development and innovation programming.

BRGM is a European leader in research in the fields of geology and related subsurface resources; it has managed or participated in a number of projects co-financed by the successive EU Research and Technological Development Framework Programmes. It is also a member of the European Technology Platform on Sustainable Mineral Resources.

ADEME (French Environment and Energy Management Agency) and ANR (French National Research Agency) have launched specific R&D programmes focused on environmental technologies. These programmes include specific actions on waste recycling (recycling technology development, systemic approach, life-cycle assessment tools, material substitution,...). In order to bridge the gap between R&D and industrial full scale application of environmental technologies, ADEME, OSEO and the French Ministry of Industry have also launched a specific programme named "Ecoindustrie". The primary objective of this specific programme is to speed up the transfer of innovation to the market. Material and metal recycling are key priorities of that programme.

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.

A detailed analysis of the gaps and needs is presented in the European Technology Platform on Sustainable Mineral Resources "Vision Document" and in the current, third, edition of its Strategic Research Agenda.

BRGM stresses the need that mineral resources be given a much higher priority in national and EU research programming, due to their critical importance to both the French and the EU economy.

Some coordination in the programming at EU and national levels appears desirable, as is called for by the European Commission in its current FP 7 "Cooperation/ Nanosciences, nanotechnologies, materials and new production technologies" call for proposals ; that includes a call for an ERA-NET on the Industrial Handling of Raw Materials for Europe Industries.

Please note that the priorities expressed here are those of a geological survey with extensive experience in mineral exploration, ore processing and processing of secondary materials, raw materials life cycle analysis, environmental issues related to the minerals industry, mine closure management. BRGM is not qualified to present a detailed research agenda on metallurgy or materials science, which would need to be covered as well.

Suggested research priorities are:

- The development of an EU digital knowledge base on the 3D deep geology and mineral resources potential, from surface down to 3000 m or more, focused on favourable areas ;
- The development of an EU minerals intelligence and economic research capacity, based on existing national-level capacities (in geological surveys, other public institutions and academia), EuroStat, OECD, UNEP, the mineral industry associations and the International Metals Study Groups. EU minerals intelligence ought to integrate not only statistics on global trade, production, consumption, recycling but also research on market functioning, governmental and company strategies, foresight on emerging technologies and their likely impacts on raw materials supply, demand, flows and stocks as well as life-cycle inventories and analysis. As a first stage a Coordination Action is suggested ;
- The further development of exploration concepts and tools, including :

- o **Remote sensing** based Earth Observation

In regions with limited or no vegetation the hyperspectral (imaging spectroscopy) technology is a powerful, but non exclusive, tool to assist in

identifying possible outcropping mineral deposits, especially those with extensive hydrothermal alteration zones (this is the case for many base metal and gold deposits) ;

the development of high-resolution gravimetric, radiometric or magnetic sensors could be an avenue to be explored, but it must be noted that orebodies are frequently hectometric in size, exceptionally kilometric or multi-kilometric and geophysical contrasts between barren and mineralised rocks are likely to be much too weak to be meaningfully measurable from space ; moreover, electro-magnetic methods that play a considerable role in modern exploration require to input a strong electro-magnetic signal of highly specific characteristics into the ground, to observe its response ; this appears impossible using a space-based emitter ;

- **Geophysical and geochemical methods**

Geophysical methods are essential to modern exploration, as they are the only ones providing information on deep geological structures and on the possible existence of deep-seated, hidden mineral deposits ; they would play a key role in developing the 3D EU geological data and knowledge infrastructure needed to identify and assess the EU hidden mineral potential, as they measure the physical properties of the subsurface using a wide range of gravimetric, magnetic, electro-magnetic, radiometric and seismic signals ; depending on the scope of the exploration campaign, geophysical measurements are made using heliborne, fixed-wing or *in situ* methods (the latter including measurements in drill-holes by specifically designed probes) ; further developments of high-resolution sensors are needed, to detect weaker signals ; also, methods to filter out noise and modelling techniques should further improve ; they would be of great significance to foster the non-destructive exploration of Europe's subsurface mineral potential ;

The further development of geochemical prospecting methods, with a focus on the further improvement of *in situ* and down-the-hole real-time, direct measurement of major and trace elements in soils, rocks, water and gases at very low detection limits by means of portable systems ; geochemical methods, together with geophysics, are essential to modern mineral exploration ;

- **Ore deposit geology**

The further development of research in ore deposits genesis (metallogeny), the understanding of the controls determining their locations and the development of international digital libraries of ore body models are needed to guide future exploration ; the further development of harmonised national and continental-scale Geographic Information Systems on geology and mineral deposits, as well as the development of automated predictive mapping of potential orebodies, based on data mining techniques, to assess the probability of the existence of given orebody types in large-scale digital data arrays ;

- The development of intelligent software for the **simultaneous 3D processing and modelling** of geological, geophysical and geochemical data ;

- The further development of devices for the automated recognition of minerals in rocks and thin/ polished sections and of the distribution patterns of the various elements in minerals ;
- The further development of **eco-efficient mineral processing technologies** minimizing energy and water consumption, improved recovery of valuable minerals and the reduction of emissions and waste ; breakthroughs are required to develop eco-efficient recovery and recycling of rare metals disseminated in manufactured products (e.g. indium-tin oxide in LCD screens, rare earth in energy-saving light bulbs) ; the development of technologies and organisational systems for recycling and re-use of minerals and metals, especially of the rarer ones, from their diverse high-technology applications, is an important issue ; particularly missing are systems for concentrating very dispersed resources, such as the above quoted ones, and technologies for recovery of metals at very low grades.

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.

The European Technology Platform on Sustainable Mineral Resources Vision Document and Strategic Research Agenda provide detailed information on this.

From the point of view of BRGM, the development of the EU 3D geological/ mineral resources knowledge infrastructure would be such a major action, as it would yield information on concealed, deep-seated ore deposits that can directly contribute to the EU security of supplies if the minerals they contain contribute to the downstream EU industry.

Another most important action would be the development of a knowledge-based infrastructure (data and methods) on the materials cycles, aiming at identifying the main losses of materials in the EU economy, the main stakes in the development of “resource-efficient” technologies and the potential substitution/rebound effects between different materials.

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.

Please refer to the reply to question 23.

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.

BRGM, having no expertise related to wood, cannot answer this question.

⁹ <http://cordis.europa.eu/fp7/dc/index.cfm>

POLICY AREA: RESOURCE EFFICIENCY & RECYCLING

Major issues:

The 2008 RMI Communication identified that, while the increased use of secondary raw materials contributes to security of supply and energy efficiency. However, today many end-of-life products do not enter into sound recycling channels, resulting in an irremediable loss of valuable secondary raw materials. This mainly concerns exports of end-of-life vehicles and electronic equipment, which leave Europe as reusable products but end up being dismantled abroad. To counter these trends, the need to reinforce the Waste Shipment Regulation and related legislation was identified. Furthermore, prices of some recovered materials have reached record levels due to the high demand from third countries.

The Waste Shipment Regulation also contains requirements on exporters of waste to third countries to ensure that this waste will be treated in an environmentally-sound manner. However, compliance with this principle is not always respected.

Finally, stakeholders have identified the need for an improvement in statistics on secondary raw materials. This includes actions to be taken to measure the extent of illegal trade in products containing these secondary materials.

Questions:

27. In your view, and beyond measures already being taken (e.g. the recast of the WEEE Directive), what practical measures can be taken by the EU and by Member States to prevent the illegal shipment of obsolete end-of-life vehicles and electronic equipment?

This topic lies beyond the competences of BRGM.

28. In what ways should statistics on trade in, and recycling of, products containing secondary raw materials be improved?

This appears to be a very difficult task as the share of secondary raw materials in goods is in most cases unknown and undocumented. Many products may contain various shares of secondary raw materials. It could be a competence of statistical offices, in relation with various national specialised institutions and agencies to keep and update a database of the composition of end-of-life products through proper sampling and analysis procedures.

29. **Have you identified major problems with recovered paper? What are the main issues that need to be further analysed?**

BRGM has no expertise related to paper.