The Association of Geological Surveys of the European Union
(EuroGeoSurveys)
in their position as
custodians to their national natural resources
and
guardians of their terrestrial environment

present their contribution
to the document drafted by DG Environment, Unit A2:
TOWARDS A EUROPEAN STRATEGY FOR THE SUSTAINABLE USE OF NATURAL RESOURCES

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EuroGeoSurveys, the Association of Geological Surveys of the European Union,
Has in the past made several contributions to European Union policy that relate to the issues of sustainable management of natural resources.

- EuroGeoSurveys Opinion 8: Promoting Sustainable Industrial Development in the EU Minerals Industry
- EuroGeoSurveys Opinion 9: Minerals in Europe: the risks of outsourcing
- EuroGeoSurveys Opinion 12: The role of National Geological Surveys in Sustainable Development: Convenience of Regular Exchange of Experience and Results
- EuroGeoSurveys Opinion 15: The Management of Natural Hazards and the Environment for the Sustainable Development of Europe
- EuroGeoSurveys Opinion 21: Base-Line input and knowledge from geology to a European strategy for Sustainable Development
- EuroGeoSurveys Opinion 22: Towards a European strategy for the security of energy supply.
- EuroGeoSurveys Opinion 23: Prevention and restoration of Significant Environmental Damage

EuroGeoSurveys has also contributed in writing to the stakeholders meeting on the European Strategy for the Sustainable Use of the Natural Resources (EuroGeoSurveys Opinion 26).

EuroGeoSurveys is now presenting its contribution to the preparation of the consultation document , based on:

- The earlier EuroGeoSurveys opinions and contributions,
- A wide inventory amongst its network of over 7,000 experts,
- Contributions from the 22 member countries (15 EU member state Geological Surveys plus Bulgaria, Czech Republic, Hungary, Iceland, Norway, Poland and Switzerland).

Introduction

Sustainable development was defined by the Brundtland Commission in 1987 as:
“development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. This is a very worthy aspiration to which EuroGeoSurveys fully subscribes as a principle.

There is nonetheless, an inherent paradox in the concept of sustainable development.
“Development” is synonymous with growth, which, in the context of economic growth, the foundation of the modern global economy, demands the ever-increasing consumption of both renewable and non-renewable resources to meet global aspirations of ever increasing living standards. This is already the case for the developed world and the demand will increase dramatically in the future as the developing world seeks to approach and match the living standards currently enjoyed in the developed world.

In contrast, ”sustainable” implies equilibrium - a zero sum balance between resource consumption and use (resource use should be matched by resource renewal). Hence, economic growth and sustainability are mutually contradictory.

EuroGeoSurveys therefore welcomes the terminology used in the present document: “Towards a European Strategy for the Sustainable Use of Natural Resource”.

In this context, EuroGeoSurveys suggests that Sustainable Use may best be regarded as an aspiration goal within which all actions should be examined holistically, rather than focusing solely on any one of the four main strands implicit in the concept: economic growth, environmental protection, social effects and governance.

It is not the role or function of any national Geological Survey to enter into political debate upon this or any other political issue. Nonetheless, there is an obligation to inform the political process in order to contribute to better-informed decision making at all levels.
In this context, it lies within the responsibility of the Geological Survey to note this paradox, and therefore develop strategies, which can assist resolution of the foreseeable dilemmas and conflicts, which will arise.
Within this framework, the European Geological Surveys can act as providers of impartial geoscience information and advice, which is reliable, applicable and usable in all Sustainable Use decision making processes.

General Comments

Based on the concept discussed in the introduction and the mission of its member national Geological Surveys, EuroGeoSurveys, in general terms, considers the paper a very positive contribution to the development of Sustainable Use policies. The document defines a sound basis for a European policy, in a field essentially ignored until now.

Hence, the points EuroGeoSurveys would like to focus its comments and contributions on, do not contradict with any views expressed in the document, but are rather meant to contribute to complete the holistic perception of the Commission and to elaborate proposals that can help tackle these supplementary perceptions.
Basically, the paper deals with Sustainable Use of resources in the European Space. The point of view developed is based on and dominated by a consumption and product approach, with a thesis of de-materialization and eco-efficiency.
EuroGeoSurveys proposes to complement this view with:

- A better approach of the geographic origin of the resources,
- A better defined consideration on extraction and first processing issues,
- An approach of the cycle of elements “from cradle to grave”,
- A better consideration of the waste issue.

EuroGeoSurveys strongly believes that in order to develop and install an EU policy that will preserve the equilibrium between rational exploitation of resources and conservation of nature and biodiversity, taking into consideration a stable social environment, an EU wide legal harmonization of environmental protection and resource exploitation as well as a standardized monitoring authority is an absolute necessity.

To this respect, EuroGeoSurveys stresses the necessity to make available for EU policies, adequate tools in terms of data gathering, reporting, monitoring, advice and suggests the recognition and installation of national Services of General Interest (National Geological Surveys)

coordinated and facilitated through a European centralized association (EuroGeoSurveys) or a European Agency.

Detailed comments

Resources, a first look

EuroGeoSurveys agrees with the generalities of the classification proposed in the document. However, we would like to make the following observations:

- We would like to add to renewable resources that are non-extinguishable Geothermal Energy in all its forms. Geothermal energy is a sustainable resource that, with the necessary stimuli, can develop into a substantial "green energy" resource. Development of this resource is essentially not polluting and does not generate waste products. The operation uses limited space at the surface.
- In the opinion of EuroGeoSurveys, Land should be classified as a non-renewable, extinguishable resource: a classification more compatible with the human, rather than geological time frame perspective.
  Land is being consumed and not usually renewed, by erosion and inundation, processes that are likely to accelerate under the influence of climate change.
  Land is also being consumed through expansion of infrastructure developments thereby reducing land availability for other uses such as leisure, habitat conservation, ect.
- EuroGeoSurveys would like to point out that in the present document, the term Soil is strongly based on an agricultural and soil scientific approach, concentrating on food production and visualizing soil as a living medium with its own biodiversity.
  But soil is also an important source of raw materials (e.g. groundwater, gravel, peat, ect.). Actually, the document should use the term "superficial deposits" rather than soil. Soil is indeed only the very thin, uppermost layer of the superficial deposits. This terminology would constitute a better basis for incorporating all the needs of human beings and all kinds of land use, including agriculture and forestry, as well as soil as a basis for building roads and settlements and other infrastructure.
- EuroGeoSurveys proposes another version of the classification of resources (See Annex 1).
- EuroGeoSurveys would like to draw the attention to the major characteristics of the geographic origin of the resources.
  Renewable resources and space mainly deal with the European area, while non-renewable resources mainly refer to areas outside of Europe. This is specifically the case for metals (recyclable) and fossil fuels (extinguishable, non-renewable and non-recoverable) while other minerals (e.g. building materials) are largely available in Europe.
  The term "recoverable resources" should be used with some restriction. The statement in the document that all minerals are recoverable resources "that become gradually dispersed by natural causes (leaching) or by human activities (mining and use)" and that "in principle, recovery is possible, but requires a lot of energy, particularly if dispersion in the environment has taken place" is questionable.
  EuroGeoSurveys would like to bring under the attention that paper (containing kaolin or limestone) can be recycled, that glass (made of silica sand and dolomite) can by recycled, that even concrete (cement and aggregate) or brick (limestone and clay) can by recycled, but that the raw materials used to manufacture such products, once extracted and processed, cannot be recovered with the technology we possess today.

- Space is, in the present document, only looked upon as a surface (2D) dimension, but should realistically also include an "in-depth" (3D) dimension.
Indeed, as geological knowledge develops, ever more opportunities for subsurface development are recognized, all of them competing for subsurface space.
And although this is particularly important in urban areas (network, underground buildings, transportation…) it also applies to mountainous regions (tunnels) as well as former mining districts and waste management sites, or even hydrocarbon exploitation areas in competition with CO_2 injection or geothermal developments

Problems and Challenges to be faced

The approach developed in the document is essentially focused on issues limited to the European space. An approach too restrictive to be realistically acceptable.
The question of equity deals primarily with the prices paid to producing countries and conditions of extraction of resources overseas. Similarly, scarcity of space is an issue that is not uniformly distributed across Europe, or even across the world.

EuroGeoSurveys stresses the fact that most of the metals and fuels consumed in the European Union are not extracted from "home territory". In other words Europe practices non-sustainable exploitation of its resources on its own territory and covers up by large import activities. Recognizing this reality, Europe should consider the essential necessity to implement strategic plans to develop and maintain capacities to locate and master access to those resources available worldwide.
In the United States the United States Geological Survey (USGS) achieves such goal.
No such organization exists at EU level. And although National Geological Surveys have historical interests, no requirement, no centralized command exists for developing an approach backing EU interests. In other words, Europe is lacking an elementary tool to (a) master globalisation issues in the strategic fields and (b) monitor Sustainable Use of raw materials.

On the other hand, construction materials are reasonably abundant in Europe. These raw materials are notably necessary for civil works and infrastructure building. As far as these constructions are meant for sustainable infrastructures, there is no obvious reason to limit their use and consider "de materialization".

Review of the current situation

To EuroGeoSurveys, the statement that "scarcity of resources, such as fossil fuels and metals is not a major concern" is used out of context.
The issue forms in fact a major part of most strategic planning at international level: there are even wars fought over the issue.

For several years now, exploration and production techniques have developed such that ever smaller and ever more complex deposits can be developed. However, such development is costly, in terms of investment and production as well as in terms of environmental impact. Indeed, the lower grade the ore that is being produced, the more space is claimed, both in terms of surface and in terms of subsurface. Therefore, no matter what low grade or complex reserves available in Europe, import remains economically interesting.

To Europe, security of supply of raw materials is not a strategic issue as the European Union fully relies on import in a free market, made possible through its US ally mainly. Indeed, Europe has no independent capacity in this field, not even foresee in the basic needs of knowledge of the resources. Knowledge of resources is a major issue, both to determine policies and economy, and to prepare for the future.
Even major changes in technology (e.g. fuels cells or catalysts) rely on energy needs and on a need for rare metals. Basic knowledge of reserves and geographical distribution of resources form an integral part of the detailed analysis of the cycle of each element (metal or fuel) “from cradle to grave”.

Decoupling economic growth and environmental impact

(Mining and Mineral Resources).
EuroGeoSurveys has carried out a review of the study, which has triggered the alarms in the EU. The study was carried out for the European Environment Agency (EEA) by the Wuppertal Institute for Climate, Environment and Energy. The study clearly demonstrates that the EU has failed to decouple economic growth from the intensified use of natural resources, thus increasing the burden on the global environment.
Indeed, the raw material requirements of the 15 EU member states, between 1985 and 1997, have increased almost as fast as its economy has grown.
The study introduces a new aggregated indicator for overall stress on the environment: Total Material Requirement (TMR). The TMR measures the turnover of all domestic and imported raw materials, except for air and water that are extracted from nature to support human activities, including all resources required for industrial activities, transport, energy, and food supply. It measures the environmental impact associated with resource extraction, materials and energy use, and generation of emissions and waste.
The study evaluated TMR’s of extraction from domestic sources as well as imports along with their hidden flows - extractions not put to use but that still have a burden on the environment (e.g. mining waste).
One fundamental conclusion of the study was that domestic extraction tends to use resources with higher resource efficiency, while imported metals, minerals and agriculture products are associated with higher hidden flows per commodity, hence a higher burden on the environment in foreign countries.
EU countries’ predominant material requirements are fossil fuels, metals and minerals, but extraction of biomass raw materials from plants and crops and erosion of agricultural soil are also significant factors in the EU ’s resource demands.

The study notes that foreign TMR is significantly influenced by the high demand for luxury and precious commodities within the EU.
Between 1995 and 1997, the TMR rose by 3% from 18.1 to 18.7 billion tones, almost entirely due to increased materials import, particularly of precious metal ores, whose extraction creates large volumes of mining waste.

The study provides evidence for the EuroGeoSurveys Opinion n°9: “Minerals in Europe: the risk of outsourcing (27/03/2000),” later used in the “Communication from the Commission: Promoting Sustainable Development in the EU non-energy extractive industry” (Brussels 03/05/2000 COM (2000) 265), stating that mineral resources foreign outsourcing generates a more heavy environmental impact than does domestic extraction.

Therefore, any policy developed should include not only a clear view of the resources and their sustainable use in the EU geographic area, but also a worldwide view for all those resources that are not available in sufficient quantity in the EU space.

Mineral Resources in Europe

Although there are no reliable statistics, there are in the EU, more than 60,000 non-energy mining operations. Total direct employment in the mining industry in the EU is estimated to be of the order of 300,000.
The total, sellable material production is estimated at 8,000 Mt (with total extraction around 20,000 Mt) per year.
The aggregates sector alone produces some 3,000 Mt per year.
It is not surprising that fossil fuels and their hidden material flow make up a large percentage of the total materials used. More surprising is that in countries such as The Netherlands and Germany, metals, industrial and construction minerals represent 34.6% and 39.7% respectively of the total material consumption, (in real numbers: 27 t and 33 t per capita compared with fossil fuel consumption 25 t and 39 t per capital) (World Resource Institute, 1991 data).
Assuming an average minerals consumption of 30 t per capita, this amounts for the EU population of 376,5 Million, to an estimated total of 11,295 Mt.
Any future legislation will have to take into account the economic and social importance of a basic sector that feeds 35% of the materials needed by the EU industry, providing a permanent employment to 300,000 EU citizens of the EU, whose population needs around 30 t per capita to maintain its standard of living.

EuroGeoSurveys approach to the sustainable use of land and natural resources

EuroGeoSurveys emphatically endorses and supports EU proposals for a far higher level of mandatory re-cycling of all forms of waste materials, as geologists, above most other specialist sectors, have a far keener appreciation of the non-renewable nature of most raw materials. This is especially the case for fossil fuels and all mineral resources, no matter the scale of known or potential resources, as all are finite and will be extinguished at some time in the future. Hence, their conservation, through significantly enhanced levels of re-cycling, is vital if we are to avoid "compromising the ability of future generations to meet their own needs" no matter how far into the future those "future generations" might be.

Any basis for sustainable use of natural resources should be based on and include:

1) Policies to avoid unnecessary and costly imports of mineral raw materials from abroad unless, sustainable use concepts form the basis of foreign production policies.
   - The EU should not export its environmental problems to countries, which do not have the knowledge or the money to cope with them.
   - Foreign dumping on the EU market results in prices not taking into account hidden cost.

2) Policies to make a real and full-cost accounting of the different alternatives to mineral extraction when competing for space.

3) Policies and financial resources for long-term monitoring in order to register, or estimate materials and waste streams in the EU, including obviously imports and exports, as only statistical data provides an accurate view of particular resource

- Geological surveys have been providing a general view of not only the material flow, but also of the basic materials need of the industry using such raw materials (e.g. “Panorama Minero” in Spain, “Mineral Yearbook” in the UK, “European Mineral Yearbook” by EuroGeoSurveys, “Rohstoffwirstlaftliche Länderstudien” by the Germany Bundesanstalt für Geowissenschaften und Rohstoffe.

4) Strategic plans to ensure security of supply from areas outside of the EU. To this end, the EU should build a clear view on the availability and geographic distribution worldwide for all resources. The exercise should not be limited to existing data from foreign literature, but should rather be built on clear and prospective analyses based on acute knowledge in the field worldwide and through remote sensing techniques.

In the US, such task is handled by the United States Geological Survey (USGS), a 10,000 staff organization under the Ministry of the Interior. No such organization exists at EU level. Europe has all necessary technical tools readily available with 7,000 staff of the National Geological Surveys. The only problem is that there is no single, centralized coordination, and that no command is passed at EU level.

5) Policies and strategic plans to make land and land use inventories both at the surface and in the subsurface, and to define land use plans based on a combination of resources, economic and human interest as well as environment.

6) Schemes to develop public knowledge of resources. This is a major target as the public knowledge of resources determines crucial questions of public policies such as pricing or private appropriation. An initiative of the Commission (called INSPIRE) deals with the issue of geographic information for Europe. Both approaches should complement each other in this respect, whereas at present, both practically ignore this essential issue. The Commission, having created in the form of EEA a tool to develop public knowledge in the field of environmental issues and pollution, should in parallel develop a similar tool to master information on natural resources.

7) A system of regulations, taxations and incentives as precursor to the development of new innovative technologies resulting in new business concepts for the management of sustainable use of raw materials, in equilibrium with economic growth and conservation of nature and biodiversity. Any such regulation, taxations and incentives should take a holistic approach; e.g.

- All resources compete for land, therefore policy efficiencies in different areas need comparison (subsidized crops wasting land and water and polluting land with pesticides and fertilizers, versus other more peremptorily uses of space).
- All regulations need to be modelled for short and long term impact (it is not clear if CO_2 taxation will have the result projected: CO_2 caption requires large amounts of energy, thus resulting in resource inefficiency, while CO_2 will escape taxation as result of storage in the subsurface or the ocean; taxation on waste heat (resource inefficiency) might have been a more effective approach stimulating research, investment and increased efficiency.

Figure 1, Resource Classification