

# **EuroGeoSource: sharing data and services on energy and mineral resources in Europe following INSPIRE**

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## **Abstract**

This paper presents the current status of the EuroGeoSource project, which intends to facilitate the sharing of European energy and mineral resources data and services by means of a distributed web system following INSPIRE. This three-years project is in the middle of its second year, but has already produced some significant results.

**Palabras clave:** INSPIRE. Minerals. Energy. Europe. SDI.

## **1 Introduction**

EuroGeoSource (“EU Information and Policy Support System for Sustainable Supply of Europe with Energy and Mineral Resources”) is a project funded by the European Commission (7FP, ICT Policy Support Programme, Theme 6 – Public Sector Information CIP-ICT-PSP-2009-3) that is being developed by a consortium coordinated by the Nederlandse Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek – TNO, and currently also integrated by:

- Geological Survey of Slovenia (Geoloski Zavod Slovenije, GeoZS)
- Ministry of Economy, Energy and Tourism (MEET), Bulgaria

- Geological Institute of Romania (Institutul Geologic al Romaniei, IGR)
- Polish Geological Institute (Panstwowy Instytut Geologiczny, Panstwowy Instytut Badawczy, PGI)
- Geological Survey of Estonia (Eesti Geoloogiakeskus oü, EGK)
- Geological Institute of Hungary (Magyar Allami Foldtani Intezet, MAFI)
- Royal Belgian Institute of Natural Sciences (Institut Royal Des Sciences Naturelles de Belgique, RBINS)
- Geology and Energy National Laboratory of Portugal (Laboratorio Nacional de Energia e Geologia I.P., LNEG)
- Geological, Seismic and Soil Survey of Emilia-Romagna Region, Italy (Servizio Geologico Sismico e dei Suoli, SGSS)
- Universidad de Zaragoza, Spain (UNIZAR)
- Geodan Software Development & Technology G. V., The Netherlands (Geodan)
- GeoSpatiumLab S.L., Spain (GSL)
- The Geological Survey of Denmark and Greenland (GEUS).

The project is developing the EuroGeoSource web GIS system, that will incorporate a number of spatial data services following OGC and INSPIRE specifications. The system will allow users to identify, access, use and reuse in an interoperable and seamless way, and for a variety of uses, aggregated geographical information on energy and mineral resources, covering a significant part of Europe and coming from a wide range of sources, from local to European level.

By developing web services for sharing spatial data between public organizations and authorities (including European Commission (EC) and European Union (EU) research and policy making institutions) as well as with commercial stakeholders, the project will enable the creation of value-added services (such as demand-supply modeling) for the sustainable geoenergy and mineral supply of Europe.

The EuroGeoSource system, including the metadata CSW-compliant metadata catalogue and GIS web application, will enable services for the registration of data sets from different countries, the visualisation and overlay of the information layers obtained from distribute sources, and several spatial and temporal queries. The implemented solutions will provide an easy and fast access to a large and economically valuable dataset for all relevant user groups in the EU.

The system will have a software architecture based on distributed OGC and INSPIRE compliant web services that will be serving data coming from different

sources and providers. The web services will be running on hardware infrastructures located in the participating countries.

The data delivery channels will include the online visualisation of spatial and attribute data, and the possibility to order the datasets according to the security guidelines, prices and terms of use of the different the data providers.

The main problem faced by many applications developed within the framework of EC-funded projects is the maintenance of the applications once the project, and its funding, has ended. Applications that require maintenance of a central database often start to deteriorate once the project has ended. In order to ensure the sustainability of the EuroGeoSource portal after the end of the project the final demonstration system will have a distributed structure, based on web services. This means that every participant will implement the required data delivery web services and supporting software on top of their existing geo-database applications. This approach, in line with INSPIRE recommendations, will ensure proper updates of the datasets as well as technical maintenance of the web data services distributed at the data provider sites. The distributed national data services will be maintained as part of the normal workflow of the hosting geological surveys that constantly maintain and improve the quality of their data repositories.

At the end of the project, the central EuroGeoSource application will be hosted on a commercial hosting provider infrastructure, or on the infrastructure of one of the partners. A system maintenance contract will be signed with the application hosting provider for a period of at least three years following the end of the project. The contract may be prolonged. The consortium will also consider the possibility of establishing an SME that will be responsible for the further technical and commercial operation of the system.

It is expected that the consortium will probably be applying a 'mixed' commercial model for the maintenance of the system after the end of the project. During the initial period, the model will include both contributions from the system owners and profits generated from the commercial services offered by the system. The commercial services will mainly concern the delivery of detailed information about oil and gas fields and mineral deposits and the provision of geological and economic analysis of geological prospects. After one or two years, the system should be able to generate profits that will be used for its maintenance and for developing new services. A detailed exploitation plan will be developed as part of the project (Work Package 11).

The partners will be responsible for the maintenance of their web services and databases. The project consortium will remain the owner of the central EuroGeoSource web application developed in the project. The partners will remain the owner of their web services and databases.

The software code, developed for the central web GIS application and attribute delivery services, will be disseminated among the partners for further use as open-source software. The consortium will consider the possibility of releasing the EuroGeoSource GIS application together with the other OGC services (metadata catalogue, web map server, etc.) as an open source 'toolkit' that can be used by other EU geological organizations for the implementation of INSPIRE-compliant spatial data infrastructures, web services and web GIS applications. No such open source tool kit is currently available.

The EuroGeoSource project web portal, shown in Figure 1, is located in <http://www.eurogeosource.eu>. It holds up-to-date information and news about the project, and also links to the public deliverables and public presentations.

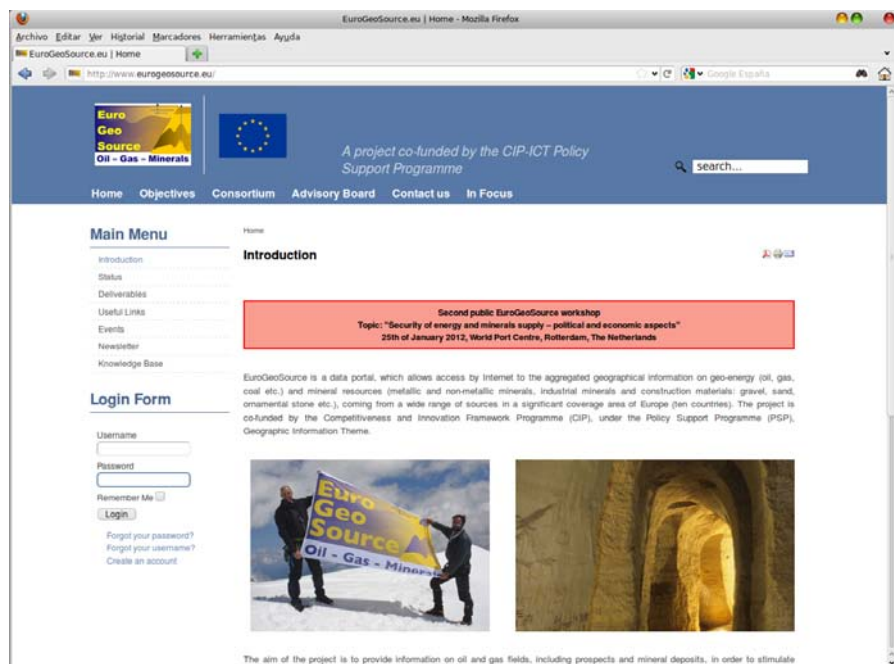


Figure 1: The EuroGeoSource web portal

## **2 The EuroGeoSource Internet Policy Support System**

One of the objectives of EuroGeoSource is to build an Internet Policy Support System that can be used for sustainable supply of Europe with energy and mineral resources. The web GIS based system will make it possible to visualise and deliver spatial and attribute information regarding the hydrocarbon and mineral resources in the participating EU countries as well as data about depleted and prospect reservoirs and the transportation network.

The proposed system will give companies and authorities across EU and non-EU countries reliable tools for online visualisation and access to attributes of oil & gas fields and mineral deposits, taken from the spatial datasets offered by the partners. The system will also contain advanced tools for data presentation, visualisation, analysis, ordering, and reporting. It will also allow for an easy reporting of the key economic information in form of reports, maps, etc. on a regular basis.

The system will have a multi-lingual interface, encompassing the selected languages of the participating countries. It will include a rich Internet application, incorporating a variety of web services of different types. These services will be compatible with INSPIRE regulations.

## **3 Current Status**

The first phase of the project is already finished, and the second one has started. This includes the overview of the needs of potential users of the system, an analysis of the organisational and political aspects of geo-energy and mineral resource data management in the participating countries, and the specification of the requirements and architecture for the EuroGeoSource system. A first prototype for this system has also been developed. Figure 2 shows a screen capture. The prototype is built around the open source component Open Layers<sup>1</sup>, and allows to search for, and visualise, mineral information in the area of interest of its users. It

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<sup>1</sup><http://openlayers.org>

also shows a few already available web map services with information relevant to the EuroGeoSource project.

All these results were presented at the first public workshop in Budapest in March 2011. The second public workshop will take place on January, 25th, 2012, in the World Port Centre, Rotterdam, The Netherlands, and its main topic will be “Security of energy and minerals supply - political and economic aspects”.

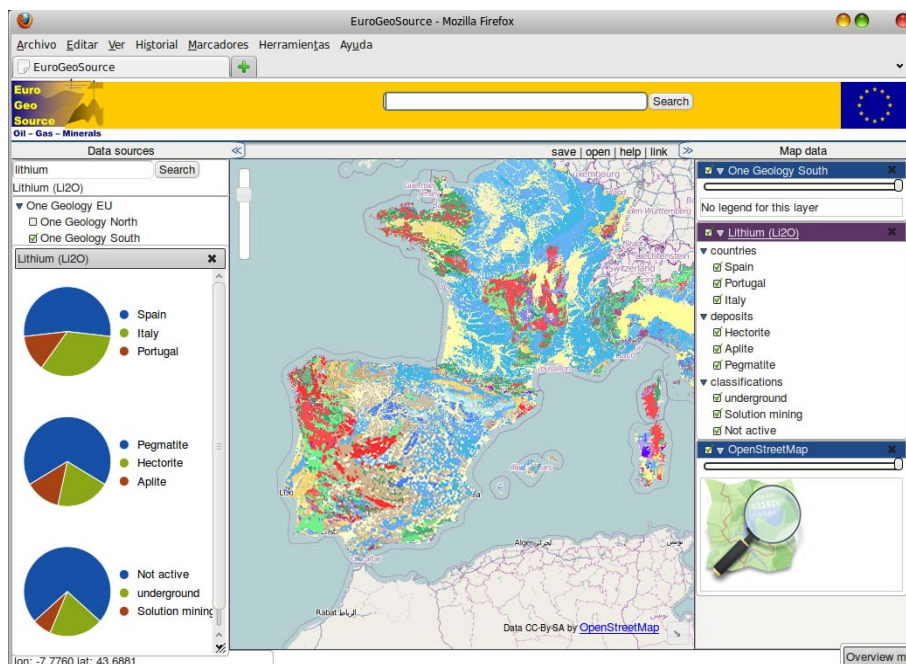


Figure 2: EuroGeoSource web application prototype

## 4 Conclusions and Future Work

The EuroGeoSource project is currently on schedule. A data model for energy and mineral resources, agreed upon by the partners and compatible with the INSPIRE data models, is almost finished. The system implementation has already started, and there is a prototype to test ideas, request inputs and comments and to show some results. One of the main objectives of the project is to keep it working after the end of the funding. To achieve this objective, it will be necessary to work in the dissemination of information about EuroGeoSource. Dissemination activities (web portal, flyers, public presentations, public workshops etc.) are intended to

encourage other geo-energy and mining companies and governmental agencies to take advantage of the EuroGeoSource portal for the dissemination of their data.

### **Acknowledgments.**



This work has been partially funded through the EuroGeoSource project (project number 250532), from the European Union's ICT Policy Support Programme as part of the Competitiveness and Innovation Framework Programme. This work reflects only the author's views and the European Union is not liable for any use that might be made of information contained therein. The work has also been partially funded by GeoSpatiumLab S.L.