EuroGeoSource: INSPIRE compliant information on energy and mineral resources on your Android phone

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Introduction

A central problem Europe is facing today is to secure its energy and non-energetic minerals supply. Since disruptions and shortages are immediately felt by the citizens and can have large impact on economy as well as repercussions on foreign relations, energy security is today very high in the political agendas across Europe and at the Commission. EU authorities currently compile their long-term policies regarding the need for oil, gas and minerals, including estimates of the required import, from national reports contributed by the member countries. These reports contain only generalized information regarding reserves and production forecasts for a country as a whole. The high level of generalization of the hydrocarbon reserve information available at EU level and the lack of easily accessible, reliable and detailed data that could support decision making do not allow a fast response to crisis situations and significantly reduce the accuracy of the long-term planning of the geo-energy supply of Europe.

Aim and status

In three years (April 2010 – April 2013) the EuroGeoSource project (www.eurogeosource.eu) will develop a multilingual web GIS system that will allow users to identify access, use and reuse aggregated geographical information on geo energy and mineral resources, provided by geological surveys from at least ten countries in Europe. In April 2012 the EuroGeoSource system is implemented in the cloud, supports two languages (Dutch and English), serves data from five countries, provides services that calculate summary statistics on the fly, has incorporated tiled maps from other existing services (e.g. OneGeology Europe, Corine 2000, Open Street Map), and views services for 93 additional geological maps from the Southern Permian Basis Atlas. Furthermore, the system supports both desk top and Android clients.

Collaborative framework

On important task within the project is to build a collaborative framework between the major stakeholders in the energy and mineral resources sectors of the EU economy, including the corresponding directorates of EC, national ministries, the key market players, such as production and transportation companies, also outside the EU. The framework will be built by organizing three public workshops during the execution of the project. The first international public workshop (Data and service needs) was held in Budapest in March 2011, the second (Security of energy supply) in Rotterdam in March 2012. These workshops are used to present the project results to the wider public and to improve the EU and International cooperation in harmonization and interoperability of energy and mineral resources data availability.

INSPIRE

The data that is going to be served at the EuroGeoSource web system has to be compatible with INSPIRE. To ensure this compatibility project representatives are

active in the thematic working groups ‘geology and minerals’ and ‘energy’. Furthermore the project, as registered SDIC, has tested the INSPIRE data specifications version 2.0. The set of key attributes in the EuroGeoSource data model is grouped in general data of the site, data on location, administrative data, economic data and additional data. The data are mapped to the INSPIRE data specifications (version 2.0) for the themes geology, minerals, energy and administrative units, leaving twenty-one attributes that could not be mapped. The mapping showed that the connection between the different data themes and the rationale within each theme in INSPIRE is not yet optimal, resulting in multiple references our redundancy when entering data. The testing of the INSPIRE data specifications resulted in 49 issues (20 related to energy, 25 to minerals and 4 to geology) from which 7 were labeled as critical, 39 as normal and 3 as minor. These insights are reported to the INSPIRE thematic working groups in detail and discussions between the project and the working groups are still ongoing to improve the final versions (3.0) of the data specifications.

Cloud and Android

Although the data originates from services and databases installed at the different participating Geological Surveys, cloud computing is used to fulfil basic (non-) functional requirements related to performance, availability and scalability.

The system supports searching for occurrences of commodities throughout Europe. In case all information is available on distributed servers, such a query will have to be executed at every geological survey, resulting in a high risk of low performance. The implementation in the cloud facilitates an optimised search index, speeding up performance and reducing the risk of having actually inaccurate results if local services are down or unreachable.

The system also uses cloud computing to compute so called tiles of the WMS services. A typical WMS setup is only able to support a very limited number of concurrent users and requests per second as it creates a map per request, often resulting in poor usability if many users are accessing the system or if the system is over-requesting the individual WMS. Another reason to (pre-) create and store tiles in the cloud is because other existing map services are used (e.g.OneGeology Europe) that only support the geographical coordinate system ERTS89. While this coordinate system is very useful for exchanging information, it is a very poor coordinate system for portraying geographical maps.

The implementation of the EGS system in the cloud ensures satisfactory performance of the system, even for an ANDROID client operating on a 3G network. This has been demonstrated successfully during the second workshop in Rotterdam in March 2012.

Future

In 2013 the EuroGeoSoruce system will serve data from 10 countries. The system is dynamic, meaning it can easily be expanded to cover data from other countries and support additional languages. To facilitate this, tools used in the project to map existing data to the EuroGeoSource data model and create web services from this are freely available, together with a detailed cookbook. As such, the EuroGeoSource system can be the first stepping stone for an European Geological Data Infrastructure, ensuring sustainability and creating opportunities for the ambitions in the Europe 2020 strategy.