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Geological subsurface data collection as a part of the European ESTMAP Project (Energy Storage Mapping and Planning)

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There is a strong link between energy security and the "2030 climate and energy framework" of European Commission (the EC is the executive body of the European Union). Reaching the goals of the "2030 framework" both efficiently and at the lowest possible costs for all is seen as a key step to address the energy security challenge in the long run. This requires elaboration of the framework for investments in renewables and energy efficiency. This planning has to be based on a robust and integrated set of data.

As most data relevant to energy storage exists in a fragmented form, the major work in the ESTMAP project consists of compiling existing data in a unified database and exploiting it to optimize energy systems planning. Geologists, engineers and system modellers joined forces to define the format and the content of a database of both subsurface and above surface storage sites (existing, planned and potential). The idea is to ensure that the newly compiled dataset will fit the needs for robust modelling, planning and designing on a coherent basis and comparable among Member States and other European neighbouring countries. One of the project output consists of a geographical database providing information on distribution and expected capacity of existing and future energy storage sites in Europe, including costs and accessibility. Both subsurface storage options (hydrogen, compressed air, natural gas, underground pumped hydro, etc.) and above ground storages (pumped hydro, LNG, liquid air, etc.) are taken into account.

In this project, BRGM, assisted by TNO, CGS, Ecofys and VITO, is in charge of data collection of geological subsurface energy storage. The objective of this task is to gather readily available and public data on existing and future potential storage sites. These data incorporate (1) the geographic location, description, characterization, subsurface properties and feasibility and capacity assessments of the subsurface reservoirs, as well as (2) the identification of known subsurface storage facilities attached to these reservoirs.

A co-operation with European national geological institutions has been established. Co-operation agreements were concluded with members of EuroGeoSurveys and ENeRG groups. In countries not represented in these networks, national partners were contacted individually. The ESTMAP geological subsurface database populates data from EU member countries, the countries of the European Free Trade Association-EFTA (4 countries) and the Member of the Energy Community (8 countries). More than 920 subsurface sites spread around Europe have been identified during the subsurface data collection. Some of these have assessment information in term of proven, possible, probable, or assumed energy storages. All these data are forwarded for integration in the database to propose further modelling during the year 2016. ESTMAP project provides the opportunity to review the available public geological subsurface data in the European countries. The first encouraging results let open the possibility for further European cooperation in the future.