Geophysical Research Abstracts,
Vol. 11, EGU2009-13806, 2009
EGU General Assembly 2009

A methodology for the geological and numerical modelling of CO2 storage in deep saline formations

R Guandalini, F Moia, G Ciampa, and C Cangiano
CESI RICERCA SpA – Environment and Sustainable Development Department, Via Rubattino 54, I-20134 Milan, Italy

Several technological options have been proposed to stabilize and reduce the atmospheric concentrations of CO2 among which the most promising are the CCS technologies. The remedy proposed for large stationary CO2 sources as thermoelectric power plants is to separate the flue gas, capturing CO2 and to store it into deep subsurface geological formations.
In order to support the identification of potential CO2 storage reservoirs in Italy, the project "Identification of Italian CO2 geological storage sites", financed by the Ministry of Economic Development with the Research Fund for the Italian Electrical System under the Contract Agreement established with the Ministry Decree of march 23, 2006, has been completed in 2008.
The project involves all the aspects related to the selection of potential storage sites, each carried out in a proper task. The first task has been devoted to the data collection of more than 6800 wells, and their organization into a geological data base supported by GIS, of which 1911 contain information about the nature and the thickness of geological formations, the presence of fresh, saline or brackish water, brine, gas and oil, the underground temperature, the seismic velocity and electric resistance of geological materials from different logs, the permeability, porosity and geochemical characteristics. The goal of the second task was the set up of a numerical modelling integrated tool, that is the in order to allow the analysis of a potential site in terms of the storage capacity, both from solubility and mineral trapping points of view, in terms of risk assessment and long-term storage of CO2. This tool includes a fluid dynamic module, a chemical module and a module linking a geomechanical simulator. Acquirement of geological data, definition of simulation parameter, run control and final result analysis can be performed by a properly developed graphic user interface, fully integrated and calculation platform independent. The project is then completed by a public acceptance task.
The paper presents the outlines of the project, the geological data base characteristics and the description of the integrated numerical modelling tool pointed out; showing also an application to a potential Italian site in Adriatic offshore area.