CCS in the Southern Pyrenees?

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The project "Identification and preliminary characterization of geological structures for geological storage of
CO$_2$" (ALGECO$_2$) led by the IGME between 2009 and 2010 has made the first rigorous selection of potential CO$_2$
reservoirs in Spain; more than one hundred structures were identified and subjected to preliminary evaluation.
This assortment comprises more than thirty structures within the Pyrenees and the Ebro Basin (PE) domain. The
discussion, based on the oil-exploration experience and regional geological knowledge (with the compilation
of over 500 cross sections) has finally chosen 8 structures in the Pyrenees. Seismic data, oil industry wells and
surface mapping have allowed building three-dimensional preliminary models of these structures. These potential
reservoirs display storage capacities from a few Mt to hundreds Mt CO$_2$. Besides, some Pyrenean structures are
among the most favorable and reliable in the national ranking according to the panel of more than 150 experts of
the ALGECO$_2$ project.

Two Pyrenean structural traps are notable for their large potential capacity; they have been coded as PE-
GE-13 and PE-GE-14. The first one is a large and wide basement antiform located in the Northern Jaca-Pamplona
Basin. There is an extensive seismic coverage in the area and a dozen of deep wells (2 of them 4,000 m
deep). The reservoir consists of Buntsandstein sands (>80 m in thickness), being the Röt and Keuper facies
the seal. The top of the reservoir is 1,720 m deep and the structure has a map-view surface > 500 km2.
Preliminary 3D models allow estimating storage capacity > 300 Mt. On the other hand, the PE-GE-14 structure
(partially overlapped in map-view with PE-GE-13) is a cover anticline related to an underneath thrust (but
structurally higher than PE-GE-13). In this case, the reservoir-seal pair is formed by upper Paleocene platform
limestones and the Eocene flysch and talus marls respectively. The structure has an area > 100 km2. The top
of the reservoir is 1,300 m in depth and its thickness $\approx$ 80 m. It has an estimated storage capacity > 100 Mt of CO$_2$.

The exhaustive analysis of several hundreds of available seismic sections (surveys PP, DP, JAT, PJ, BB, P
& SA) and the subsequent construction of balanced cross sections would allow improving the geometric definition
of these two structures. The derived accurate 3D models would quantify the effectiveness of both traps. In
order to support these underground reconstructions, an inexpensive geophysical survey (potential fields) would
better constrain the basement-cover interface (where the reservoir is located). In conclusion, these structures
represent two suggestive potential reservoirs; besides, an advanced evaluation of them requires modest investments.