



Tracking potential targets for geothermal exploration in North-West Italy

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Geothermal sites in Piedmont have been considered low enthalpy resources. Geochemical and stable isotope data indicate that several thermal waters are linked to rain waters that follow recharge zones along faults and fracture systems reaching deeper levels where they are heated by interaction with high-temperature rocks. Western Alps are characterized by moderate heat fluxes that can be significant in some district (such as, for example, the Acqui-Visone area). Deep flow dynamics essentially follow streamlines that move downward from the central axis of the orogen toward the external domains of the chain. This configuration suggests the existence of a strong morpho-tectonic control on the location of thermal anomalies.

In the last forty years AGIP hydrocarbons exploration drilled several deep wells in the Po plain providing important information on the regional stratigraphy and temperature-depth distributions. Piedmont geothermal gradients are low (averaging $27\text{ }^{\circ}\text{C}/\text{km}$) but, in the north-central sector of the region, they may reach $31\text{-}35\text{ }^{\circ}\text{C}/\text{km}$. In particular, this geothermal gradient is near the one of the Simplon area ($36\text{ }^{\circ}\text{C}/\text{km}$). We therefore revisit the geothermometry of thermal waters throughout the region in the attempt to better decode thermal anomalies and provide some estimates of the geothermal flux in selected key areas.