

Geology as a basis for 100 years of continuous geothermal electricity generation at Larderello/Italy

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Exploitation of geothermal fluids for producing electric energy is connected to the year 1904 when in Larderello the first engine operated by means of a flux of geothermal vapor. At that time, exploration practically did not exist, and geothermal activities were concentrated where natural manifestations were massively recognizable. There, shallow boreholes (< 1km depth) were drilled. Through time, the continuous request of energy, especially after world war II, drove up research of new geothermal resources, and boreholes increased their depth down as deep as 4.5 km where rock-temperatures of >250°C are frequent. This new technological and economic effort (about 1-1.2M€ per Km, today) needs a strong support from Earth Sciences, promoting an integrated approach among the different geologic specialities, with the aim to decrease the “mining risk”, i.e. the drilling of unproductive wells. In this talk, I will present how the research of geothermal resources is today carried out: from the choice of the area to the exploitation of the geothermal reservoir without reduction. Finally, few words on the social problems that are normally faced if exploitation is acquired in crowded areas, as it is in Italy.