

DISSEMINATION AND SOCIAL STUDIES FOR GEOTHERMAL MARKET UPTAKE IN ITALY

Adele MANZELLA¹

¹National Research Council, Institute of Geoscience and Earth Resources, Via Moruzzi 1, Pisa, 56124, Italy
e-mail: manzella@igg.cnr.it

ABSTRACT

With a net electricity generation of 5.8 TWh (TERNA, 2016), an installed capacity of 1300 MW of heat for direct uses (Conti et al., 2016), and considering the number and size of Italian industries in the sector and the abundance of scientific papers from Italian institutions, Italy is undoubtedly rich of geothermal resources and expert in geothermal technologies. But it appears that such a high profile is not reflected on the society, and geothermal energy technologies in Italy, as in most European countries, are much less familiar to the general public than other renewable technologies (Eurobarometer, 2011; Pellizzone et al. 2015, 2017). On the other hand, the specialists consider and treat the geothermal sector as a *houte couture boutique*, each site requiring a tailor-made geothermal project. The lack of awareness combined with an atmosphere of highly-specialized technology that only a few can correctly manage have produced a chemical reaction, resulting in an unbalanced compound with two opposite products: an aggressive refusal for geothermal development in the territories as soon as a new plant is proposed, and the indifference of central and regional administration, reflected by the lack of proper regulation, useful incentives and effective participation of geothermal energy in the energy plans. As a result, Italian geothermal production is increasing very slowly, both for electricity and heat use.

When on 2010 the National Research Council (CNR) was given the duty to pave the road for market uptake of geothermal technologies in Southern Italy, the two projects that were carried out (VIGOR and the Geothermal Atlas) focused on spreading the awareness of geothermal energy. Many documents and products are now available, including: maps of geothermal potential for geothermal heat pump applications, electricity, district heating and district heating&cooling in 4 regions; maps of favourability to host hydrothermal, EGS and other unconventional geothermal systems in 9 regions; a series of documents explaining the technologies for producing electricity and heat (including geothermal heat pumps, district heating, greenhouses, industrial and other applications) from geothermal resources, including the description of national and international running projects for production of combined heat and power, cheese and wine production, district heating using mine waters; a description of regulation and authorization process at national and regional level (in four regions); a report of environmental aspects of geothermal energy projects, data and best practice for impact minimization; geological, technical and economic feasibility studies, including a description of administrative documents to prepare for authorization, for eight different geothermal energy applications (individual heating&cooling by open and closed loop geothermal heat pumps, district heating&cooling from high and low temperature geothermal resources, combined heat and power production, sewage sludge dehydration, balneology), as examples of the variety of use from resources in a wide range of temperature (Bruno et al., 2016; Galgaro et al., 2015; Trumpy et al., 2015, 2016).

The projects produced also two case studies on the citizens' engagement with developments towards the harnessing of geothermal energy in central and southern Italy, which at the moment remain the only two of such a type in Italy (Pellizzone et al. 2015, 2017, Manzella et al. 2018a). When compared to the experiences of social studies in other countries, as collected in Manzella et al. (2018b) or found in literature, it appears that we

are just at the beginning of a new way of planning geothermal projects in Italy and abroad. After focusing for decades on technical, logistical and economic aspects of geothermal resources and applications, nowadays social studies are producing a novel input into future policy making, by providing concrete guidelines on citizens' engagement in processes of culturally sustainable innovation. The challenge, now, is to understand how to include these new data in the practical life of geothermal planning at local, national and European scale.

Keywords: Dissemination and social studies for geothermal market uptake in Italy, promotion, social engagement, policy making

REFERENCES

- Bruno, D.E., Lombardo, G., Di Sipio, E., Galgaro, A., D'Arpa, S., Destro, E., Passarella, G., Barca, E., Uricchio, V.F., Manzella, A. (2016) Mo.nalis.a: a methodological approach to identify how to meet thermal industrial needs using already available geothermal resources, *Energy Efficiency*, **10**, 639–655.
- Conti, P., Cei, M., Razzano, F. (2016): Geothermal Energy Use, Country Update for Italy (2010-2015), *Proceedings of European Geothermal Congress 2016*, Strasbourg, France.
- Eurobarometer (2011): Special Eurobarometer 372: climate change. European Commission, Brussels. Available at: http://ec.europa.eu/public_opinion/archives/ebs/ebs_372_en.pdf
- Galgaro, A., Di Sipio, E., Teza, G., Destro, E., De Carli, M., Chiesa, S., Zarrella, A., Emmi, G., Manzella, A. (2015) Empirical modeling of maps of geo-exchange potential for shallow geothermal energy at regional scale, *Geothermics*, **57**, 173–184.
- Manzella, A., Bonciani, R., Allansdottir, A., Botteghi, S., Donato, A., Giamberini, M.S., Lenzi, A., Paci, M., Pellizzone, A., Scrocca, D. (2018a) Environmental and social aspects of geothermal energy in Italy, *Geothermics*, **72**, 232-248.
- Manzella, A., Pellizzone, A., Allansdottir, A. (Eds). (2018b) Geothermal energy and Society. *Lecture Notes in Energy*, **67**, pp. 288, Springer International Publishing.
- Pellizzone, A., Allansdottir, A., De Franco, R., Manzella, A., Muttoni, G. (2015): Exploring public engagement with geothermal energy in southern Italy: a case study, *Energy Policy*, **85**, 1-11.
- Pellizzone, A., Allansdottir, A., De Franco, R., Manzella, A., Muttoni, G. (2017): Geothermal energy and the public: A case study on deliberative citizens' engagement in central Italy, *Energy Policy*, **101**, 561-570.
- TERNA (2016): Electrical power production in Italy (in Italian). Open File Report <http://download.terna.it/terna/0000/0964/24.PDF>
- Trumpy, E., Donato, A., Gianelli, G., Gola, G., Minissale, A., Montanari, D., Santilano, A., Manzella, A. (2015) Data Integration and favourability maps for exploring geothermal systems in Sicily, southern Italy, *Geothermics*, **56**, 1–16.
- Trumpy, E., Botteghi, S., Caiozzi, F., Donato, A., Gola, G., Montanari, D., Pluymaekers, M., Santilano, A., Van Wees, J.D., Manzella, A. (2016) Geothermal potential assessment for a low carbon strategy: a new systematic approach applied in southern Italy, *Energy*, **103**, 167-181.