



Social acceptability of deep geothermal energy: overview of an online survey from five European and American countries

Lopez-Sanchez J.^a, Blessent, D.^a, Malo M.^b, Raymond J.^b, Dezayes C.^c, Goderniaux P.^d, Daniele L.^e, Le Borgne T.^f, Ramirez E.^a, Portela J.P.^a, Hernandez J.E.^a

- a. Universidad de Medellín, Programa de Ingeniería Ambiental, Carrera 87 N° 30 - 65 Medellín, Colombia
- b. Institut national de la recherche scientifique, 490 de la Couronne, Québec City, QC, G1K 9A9, Canada
- c. Bureau de Recherches Géologiques et Minières, 3 Avenue Claude Guillemin, 45100 Orléans, France
- d. Université de Mons, Geology and Applied Geology, Place du Parc 20, 7000 Mons, Belgique
- e. Andean Geothermal Center of Excellence, Departamento de Geología, Plaza Ercilla 803, Santiago, Universidad de Chile, Chile.
- f. Université de Rennes1, Rue du Thabor, 35000 Rennes, France

Corresponding author: dblessent@udem.edu.co

Keywords: Social acceptability, Survey, IGCP, Americas, Europe

ABSTRACT

Social acceptability has become an essential aspect to move energy projects forward, including energy from renewable sources such as geothermal. The UNESCO International Geoscience Programme (IGCP) and the International Union of Geological Sciences have been supporting the IGCP636 research project since 2016. This project focuses on unifying international research forces to unlock and strengthen geothermal exploitation of the Americas and Europe and belongs to the “Earth resources: sustaining our society” IGCP theme.

One of the objectives of IGCP636 is to promote a sustainable exploitation of geothermal resources and to ensure acceptance of this kind of energy by local communities. A survey was then used to evaluate the public perception and level of knowledge about geothermal energy in the five leading countries of the project (Colombia, Chile, Canada, France, and Belgium).

The international survey was based on a bilingual (French/English) questionnaire that was previously created by the Institut national de la recherche scientifique in 2013 for a study carried out in the province of Québec, Canada (Malo et al. 2015). This study was inspired by previous work on geothermal energy and renewable energy conducted around the world (Hobman and Answorth 2013; OGSAQ 2012). It was adapted afterward for an international public, translated in Spanish and Dutch, and conducted in the last trimester of 2016. It was created with ‘Question Pro’, an online question platform, which is suitable to reach the public using email, embedding in websites or posting to social networks. Results are collected automatically and their analysis can be done using the reporting tools provided by the platform. The questionnaire was characterized by some open-ended questions, but most of them were multiple-choice questions with an “I don’t know / I prefer not to answer” option available. Fourteen opinion questions and a series of demographic questions (country and city, sex, age, level of education) constituted the survey, which enclosed six parts: 1) energy issues, 2) energy production, 3) awareness of deep geothermal energy, 4) acceptability of deep geothermal energy, 5) use of stimulation (hydraulic fracturing) in deep geothermal energy project, and 6) concerns about the use of geothermal energy.

A total of 1800 respondents from five countries answered the survey (Belgium – 230; Canada – 357; Chile – 371; Colombia – 409; France – 433). The average interview length was 9 minutes.

As an illustration of the survey results, Figure 1 shows that, in general, people agree with the use of deep geothermal resources to generate electric power in all countries. However, unlike Colombia, Chile and Canada, where a percentage of respondents higher than 50 to 80 % strongly agree with the use of deep geothermal resources for electricity generation, people from Belgium and France preferred the option “somewhat agree”, suggesting that the population may have questions or doubts about the production of electricity from geothermal resources. In Chile, the high percentage of respondents (~ 84%) choosing the option “strongly agree”, reveals that Chileans have confidence in the exploitation of geothermal resources to produce electricity. This opinion may originate from the a priori knowledge that they have on these resources, enhanced by specific communication actions performed in this country. The Andean Geothermal Center of Excellence (CEGA) works to generate and improve geothermal knowledge in Chile, promoting the sustainable, environmentally friendly and economically competitive development of geothermal energy.

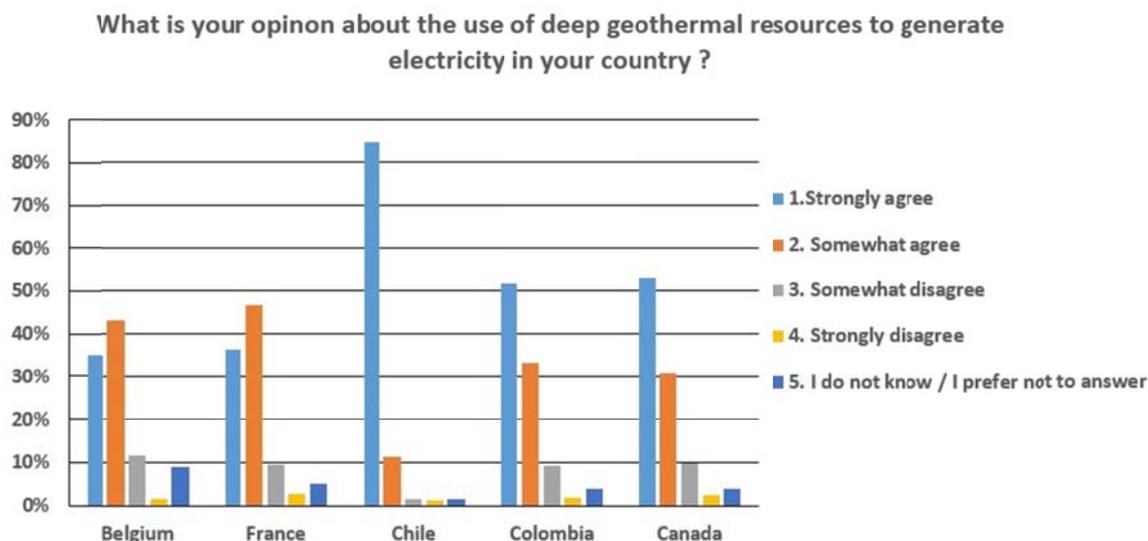


Figure 1. Perception about the use of deep geothermal resources for electricity generation in each country

Other results include answers on general topics about energy, such as the two most important issues related to energy in the country (e.g. energy independence, energy supply, energy efficiency, renewable energy development, and the cost of energy), the goal of each country with respect to renewable energy production, and the knowledge that respondents have about renewable energies. Then, answers to questions about the potential use of stimulation in order to exploit deep geothermal resources for electricity production through Enhanced Geothermal Systems indicate that the use of stimulation lowers all percentages of acceptance in all countries, highlighting the social barriers to the use of this technique, which raises doubts and concerns among the surveyed communities. Further work could be achieved with focus groups to better define public concerns related to geothermal energy development.

REFERENCES

Hobman, V. and Ashworth, P. (2013). Public support for energy sources and related technologies: The impact of simple information provision. *Energy Policy* 63: 862-869.

Malo, M., Moutenet, J.-P., Bédard, K. and Raymond, J (2015). Public awareness and opinion on deep geothermal energy in the context of shale gas exploration in the province of Québec, Canada. *Proceedings World Geothermal Congress 2015, Melbourne, Australia*. 8 p.

OGSAQ - Oil and Gas Services Association of Québec (2012). Study on the knowledge and perceptions of Quebecers about energy. Survey conducted by Leger, Project 14866-00. The entire document should be no longer than two pages, including references. Please include a maximum of one figure.]