Proceedings World Geothermal Congress 2015
Melbourne, Australia, 19-25 April 2015

Engaging the Public on Geothermal Energy

Lasse Wallquist and Matthias Holenstein

Risk Dialogue Foundation, Technoparkstrasse 2, 8406 Winterthur, Switzerland

lasse.wallquist@risiko-dialog.ch

Keywords: Public acceptance, perception, social site characterization, engagement, fairness, trust, communication

ABSTRACT

Public acceptance and stakeholder management are becoming increasingly important issues for successful geothermal development. However, fair engagement procedures may help to build and sustain society's trust in geothermal projects and their owners both on local and national levels. Drawing on a case study for the geothermal project in Groß-Gerau, Germany, we propose a three-phased community engagement process for deep geothermal power plants. For new projects, it is important for the sites to be examined not only with regard to the characteristics of the reservoirs, but also with respect to the social context. Therefore, for Phase 1, we suggest conducting the social site characterization that will already be led during the exploration phase. By means of qualitative interviews and media analyses, the public's hopes, fears, questions, concerns, and perceptions around the topic of geothermal energy can be obtained. This allows for understanding the issues on people's mind when it comes to geothermal development in their vicinity. Stakeholders will be informed on the topic of geothermal energy, and early personal relationships with project owners will be established. Based on the findings of the social site characterization, the engagement process can be tailored to the particular situation. Phase 2 involves the establishment of a stakeholder dialogue with a broad range of participants. The aim of this forum is to take up stakeholders' concerns and discuss them with the project owners. In a mutual learning process, project developers and stakeholders cooperate and work out solutions to tackling controversial issues (e.g., risk governance). This approach enables the integration of local knowledge, experiences, and different interests as well as an intensive exchange of information among all participants. Phase 3 consists of a civil dialogue in which the results of the stakeholder dialogue are presented and discussed with the general public. Geological and engineering fundamentals, as well as the opportunities and risks of geothermal energy for the specific region, may be among the topics reflected. Therefore, the most controversial issues identified through the social site characterization will be the focal points of these public meetings. An independent conception, moderation, and supervision of the three phases may be helpful in maintaining the credibility of the entire engagement process. Both qualitative and quantitative survey data support our claim that fair engagement procedures increase the public's trust in and acceptance of geothermal projects.

1.0 INTRODUCTION

Well before the 3.6 magnitude earthquake induced by a geothermal project in the Swiss city of St. Gallen, it was obvious that the way the public perceives power production from geothermal energy is becoming increasingly crucial to the further development of the technology. Public perception influences geothermal projects either directly, in the form of local action groups, or indirectly, by defining the political climate for geothermal energy production. A number of examples in different countries have shown that public opposition can considerably delay, or even stop, the deployment of geothermal projects (Reith et al., 2013; Wallquist & Holenstein, 2012). In the Upper Rhine Graben in Germany for example, public opposition has stopped a number of planned binary cycle power plants. Opponents feel threatened by seismic risks and claim—among other things—that groundwater may become contaminated. In Iceland, an ongoing debate about the rationale of further supplying heavy industry with cheap geothermal electricity is (legitimately or not) slowing down reservoir development. Some Hawaiian opponents of geothermal energy are concerned with air emissions (Boyd et al., 2002). In addition, cultural and religious values (e.g., interference with the worship of the Goddess Pele) are perceived as being threatened by further exploitation of the geothermal resources on Hawaii's Big Island (Edelstein & Kleese, 1995; Gross, 2013)). Generally speaking, it can be observed that the greater people's economic prosperity is, the more skeptically they assess large infrastructure projects, as the personal benefits of new projects become less evident to them . However, in emerging countries, such as Indonesia and the Caribbean island Dominica, public perception can also have an impact on the development of geothermal power. A geothermal project in South Sumatra was postponed following continuous local protests. Claiming that geothermal exploitation would damage the social structure of their community, protesters in Lampung succeeded in having the development of the 220 MW plant suspended. This variety of examples indicates that the reasons behind the lack of public acceptance are often manifold and highly dependent on local circumstances. For project developers and involved institutions it is therefore important to understand the socio-political context of the affected communities, the factors that drive local public perception, and the handling of these different perspectives in relation to their geothermal projects. A common issue in many controversies over new power plants is the lack of trust between the parties involved. Once trust is lost, the significance of the factual arguments fades and debates are often shaped by allegations and personal attacks (Renn et al., 1995). Finding solutions under such circumstances is exceptionally complex. Once trust is lost, it is hard to regain. Therefore it is important to engage the public in a trustworthy and transparent climate of confidence as early as possible (Dowd et al., 2011). Sustaining this trust is a challenge for all parties involved.

2.0 CASE STUDY: ENGAGEMENT PROCESS

In Germany, Überlandwerk Groß-Gerau GmbH (ÜWG), a publicly held utility company located in Groß-Gerau in the Upper Rhine Graben, is taking a pioneering role in terms of public engagement for their hydrothermal project. With the Swiss Risk Dialogue Foundation, a non-profit organization, they entrusted an independent and trustworthy facilitator with the formulation and moderation of a broad public engagement process. In addition to unidirectional communication, which is focused on a balanced presentation of risks and benefits, a comprehensive dialogue process with all local stakeholders and the general public was

developed. This created the potential for the development of an acceptable and politically robust geothermal project together with the citizens—not against them.

2.1 Social site characterization (Phase 1)

In the first phase of the engagement process, which took place at the outset during the 3D seismic survey in 2011, the Swiss Risk Dialogue Foundation conducted a local "social site characterization" in which the perceptions, hopes, fears, questions, and concerns of stakeholders and citizens around the topic of geothermal energy as well as other local issues were identified. With insights from a continuous media analysis and more than 30 semi-structured interviews with representatives of various stakeholder groups from agriculture, environmental organizations, community groups, and individuals, it was possible to understand the issues that were on people's minds in relation to geothermal power in their vicinity. Figure 1 and Figure 2 give an overview on benefits and risk concepts that interviewees perceived. Such concepts may have a considerable influence on public acceptance of a technology (Wallquist et al., 2010). Conflicts of interest and information needs were identified. Results showed that people asked for being involved in the decision procedures about the geothermal project. Interviewees were sensitized to the topic of geothermal energy and to this particular project. Hence right from the outset, an important personal relationship was established between the Groß-Gerau geothermal project and the public.

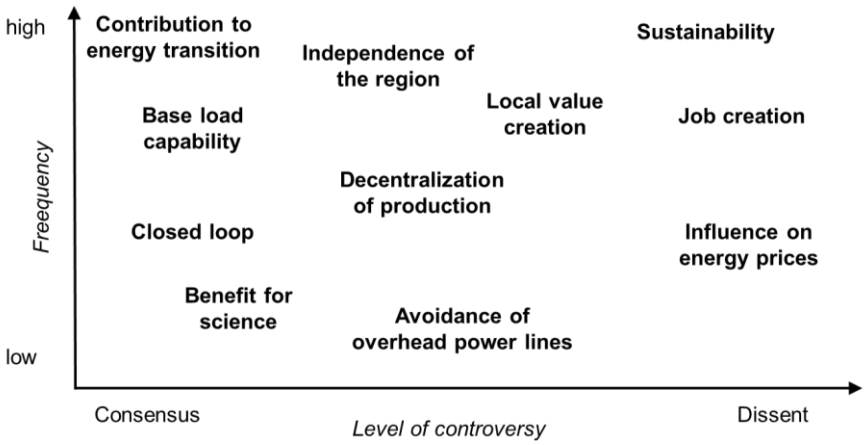

Figure 1: Frequency and level of controversy of benefit concepts perceived by interviewees.

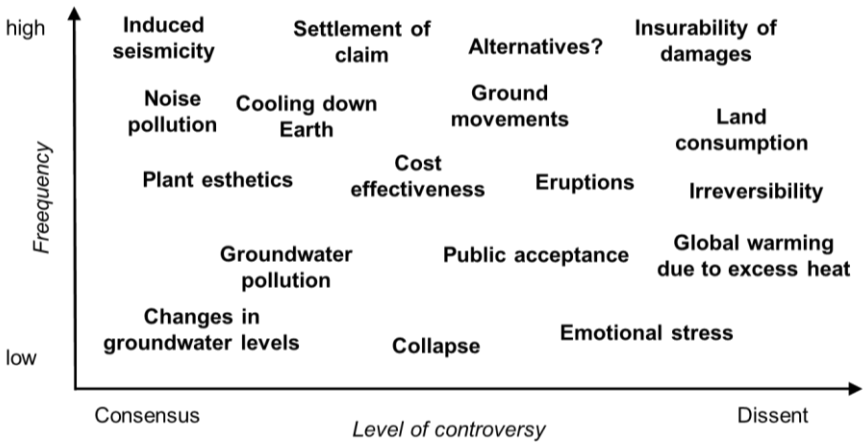

Figure 2: Frequency and level of controversy of risk concepts perceived by interviewees.

2.2 Stakeholder dialogue (Phase 2)

Based on the first interactions with important stakeholders and on the results of the social site characterization, an advisory board of 20 members representing a broad range of stakeholder groups (including local government officials) was established in November 2012. The aim of this board was to take up all questions, wishes and concerns, from other stakeholders and the general public, discuss these, and formulate requests in the form of a report addressed to the project owners. This approach enabled the integration of local knowledge, experiences, and different interests as well as a comprehensive exchange of information. The advisory board organized itself in four working groups addressing the following topics: Environmental issues (1), cost effectiveness and local benefits (2), risk governance (3) and communication (4). In regular plenary meetings, moderated by the Swiss risk dialogue foundation, the advisory board discussed critical issues related to the four topics. Project owners and geothermal experts (e.g. Horst Kreuter) from the engineering consulting company Geothermal Engineering were present at all plenary meetings, in order to provide expert guidance. By May 2013 the advisory board had reached a consensus and came up with 31 points that it requested to be fulfilled before the project could be realized. One critical point was the question of induced seismicity, and more important, claim settlement in case of damages caused by an induced earthquake. The advisory board proposed a comprehensive insurance

concept protecting citizens from potential legal disputes in case of damages. Another key request of the advisory board was that ÜWG would not go forward with the project against the will of the local population. A broad acceptance measurement within the municipalities affected by the project was proposed. In accordance with this request ÜWG conducted, after the completion of the civil dialogue, a large scale survey among the affected population.

2.3 Civil dialogue (Phase 3)

The civil dialogue process was developed based on the findings (information needs, whishes, concerns etc.) of the social site characterization. The aim was to engage as many residents of the region in the development of the geothermal project as possible. This included the provision of information and the answering of questions on one hand and a dialogue on controversial issues on the other. Several hundred local residents took part in six public meetings (600 in the first one) in spring 2013 and had in-depth discussions with experts from academia and industry. Geological and engineering fundamentals as well as the opportunities and risks of geothermal energy for their specific region were among the topics covered. Thereby, the most controversial issues identified in the social site characterization (e.g., insurability of damages or the utilization of excess heat) were at the focal point of these public meetings. Presentations and discussions were documented and published online. At the last public meeting, members of the advisory board presented their work to the public. The project owners of ÜWG commented in detail on the demands and evaluations of the advisory board's report and stated that they would base their further project planning on the advisory board's work. In fall 2013 the requested large scale telephone survey was conducted among 1000 randomly chosen citizens living in one of the affected communities. Results showed that the engagement process was well received and that a majority of the people living in the surrounding communities supports the geothermal project. Furthermore, the survey indicated that respondents preferred the deployment of geothermal power over onshore wind and biomass. Workshops with immediate neighbors are planned for the next phase. At these workshops, locally relevant details of the project design (e.g. architectural features, noise reduction measures, plantation, illumination) will be discussed with particular attention to the given constraints.

2.4 Fairness matters

Because of its roots in the region and its long history as a public utility company, ÜWG benefits from a high baseline level of trust. By way of contrast, private corporations are more often criticized for privatizing profits while socializing the associated risks. This fosters mistrust and increases the need for the independent supervision of the engagement process. In addition to adequate risk management, perceived procedural fairness of the decision process plays an important role. Fair procedures in reaching decisions about a geothermal project significantly increase people's trust in the involved parties and thus promote mutual understanding of the different positions. This understanding and willingness to exchange arguments honestly and to learn from each other provides a solid basis for a fruitful, factual debate. An indicator to illustrate the success that has been achieved with the participatory dialogue process in Groß-Gerau so far is the fact that the groups involved (from the operator side as well as the stakeholders and citizens) were satisfied with the chosen approach and, despite some topical dissent, also with the results. The credibility of the process, which was assured by the neutral process design and moderation as well as through the transparent documentation on www.dialoggeo.de, was of crucial importance. The other critical factor was of course the willingness of the project owners to consider the demands of the stakeholders when planning the geothermal power plant. Otherwise the relevance of the entire dialogue process would have been diminished. The participatory engagement on geothermal energy in Groß-Gerau is not yet complete, but the course is set and trust between the parties involved has been established.

Figure 3: Successful public engagement on geothermal energy in the Groß-Gerau dialogue process

3.0 CONCLUSION

Sustained efforts toward the inclusion of more direct, democratic elements in the planning of large infrastructure projects, which can be observed not only in Germany but also in other countries, show that the geothermal industry needs to take communication and engagement with the public seriously. This requires project owners to budget for these strategic tasks. The case of Groß-Gerau shows that sound communication and public engagement may lead to more robust decisions on if, where and how geothermal power should be deployed. For new projects, it is thus important that the sites are not only examined with regard to the characteristics of the reservoirs but also to the social context. Thereby, the extent of public engagement required to build trust and eventually realize a successful project may be evaluated. Fair public engagement procedures may however not be a panacea to public acceptance. Indeed, flawed projects are likely to be debunked in participatory dialogues. For many geothermal project owners however, it may be worthwhile to take these chances.

Further information on the Swiss Risk Dialogue Foundation and its work on geothermal energy can be found on www.risiko-dialog.ch and on www.dialoggeo.de (in German).

REFERENCES

Boyd, T. L., Thomas, D., & Gill, A. T. (2002). Hawaii and Geothermal–What Has Been Happening?. *Geo-Heat Center Quarterly Bulletin*, *23*(3), 11-21.

Dowd, A. M., Boughen, N., Ashworth, P., & Carr-Cornish, S. (2011). Geothermal technology in Australia: Investigating social acceptance. *Energy policy*, *39*(10), 6301-6307.

Edelstein, M. R., & Kleese, D. A. (1995). Cultural relativity of impact assessment: Native Hawaiian opposition to geothermal energy development. *Society & Natural Resources*, *8*(1), 19-31.

Gross, M. (2013). Old Science Fiction, New Inspiration Communicating Unknowns in the Utilization of Geothermal Energy. *Science Communication*, *35*(6), 810-818.

Reith, S., Kölbel, T., Schlagermann, P., Pellizzone, A., & Allansdottir, A. (2013). Public acceptance of geothermal electricity production.

Renn, O., Webler, T., & Wiedemann, P. M. (Eds.). (1995). *Fairness and competence in citizen participation: Evaluating models for environmental discourse* (Vol. 10). Springer.

Wallquist, L. and Holenstein M. (2012) . Stakeholderanalyse Geothermie: Analyse von Einstellungen und Wahrnehmungsprozessen. Winterthur: Stiftung Risiko - Dialog on behalf of Enerchange.

Wallquist, L., Visschers, V. H., & Siegrist, M. (2010). Impact of knowledge and misconceptions on benefit and risk perception of CCS. *Environmental science & technology*, *44*(17), 6557-6562.