

Geothermal energy and public engagement: a comparative analysis

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ABSTRACT

The public is increasingly gaining a voice within the debate over energy innovation and the role of citizens is shifting from the somewhat passive role of consumers to a new and a more active role as co-creators of innovation. Processes of innovation in the energy sector are decisive for a culturally sustainable implementation of the transition from fossil fuel to more sustainable resources, and the public plays an important role in this regard. The transformative impact of new energy resources is having a strong impact on the organization of contemporary societies and that requires new forms of energy governance, including extensive forms of participation.

Although studies on geothermal energy and public participations are being conducted across the globe, the literature is as yet a rather fragmented set of loosely connected case studies. The authors of this presentation edited a volume on geothermal energy and society, that includes selected case studies on public engagement with geothermal energy in 11 different countries worldwide, and vary in terms of geothermal, geographical, political, social and cultural features. The aim of the book was to give an overview of activities related to geothermal energy and society in order to move beyond a simple collection of scattered experiences and to make substantial contributions to the development of an emerging framework for participatory geothermal governance.

In order to bring together all the richness of the experiences presented in the chapters on the 11 country case studies, the authors have described the different public engagement mechanisms and processes that were put in place; the actors enabling a participatory approach to geothermal governance and the groups of stakeholders involved in the process; the results of these engagement activities and their impact on policymaking for energy innovation; the levels of knowledge about geothermal energy among the general public. The ultimate aim of the presentation is to provide a general overview of the state of the art of public engagement with geothermal energy, contributing to the design of new policies for research and innovation in the field.

1. INTRODUCTION

Entrepreneurs, scientists and policy makers working in the field of new energy technologies are persistently finding new reasons for engaging the public with the innovation in this realm: citizens participation can help in preventing, or at least foreseeing, eventual

future controversies, can provide fresh ideas towards new and better products and services and can increase the openness and transparency of scientific and technological developments, which is a prerequisite for a trustful relationship among the different societal actors. Further, re-defining the role of the public and the development of novel forms of public engagement activities is very much on the general political agenda across the world (Fishkin 2011).

The idea that present-day democracies need to build a new “social contract” between science, governments and citizens is increasingly gaining ground at different institutional levels across the globe (Ostrom 2010). The transformative power of new technologies - e.g. distributed energy resources (DER), key enabling technologies (KET) such as information and communications technologies (ICT) - is disrupting the boundaries between producers and consumers, experts and lay public, governors and governed. Scientists and policy makers are to come out from their ivory towers and find their place within the real world, where citizens are increasingly gaining voice in the techno-scientific debate and in the political arena, shifting from a somewhat passive role to a more active one.

In this historical context, new forms of research and innovation governance are becoming mandatory and one of the options encouraged within the European framework and beyond is public engagement with techno-sciences (Stilgoe et al 2013). The governance of new energy technology is also part of the picture (Sovacool 2014). Moreover, as energy related issues are strongly intertwined with cultural, social, economic and political questions, they entail a complex system of values, rights and powers, requiring constant and aware public scrutiny and citizens participation.

Public engagement experiences in the geothermal field are rapidly increasing worldwide. Many journals and conferences are hosting specific issues or sessions on the societal themes connected to geothermal energy. The number of geothermal research projects assessing also non-technical issues is growing, and in some Countries various forms of citizens and other stakeholders’ consultation are directly embedded

within the institutional framework (e.g. in New Zealand and in the Philippines). The ambition of this

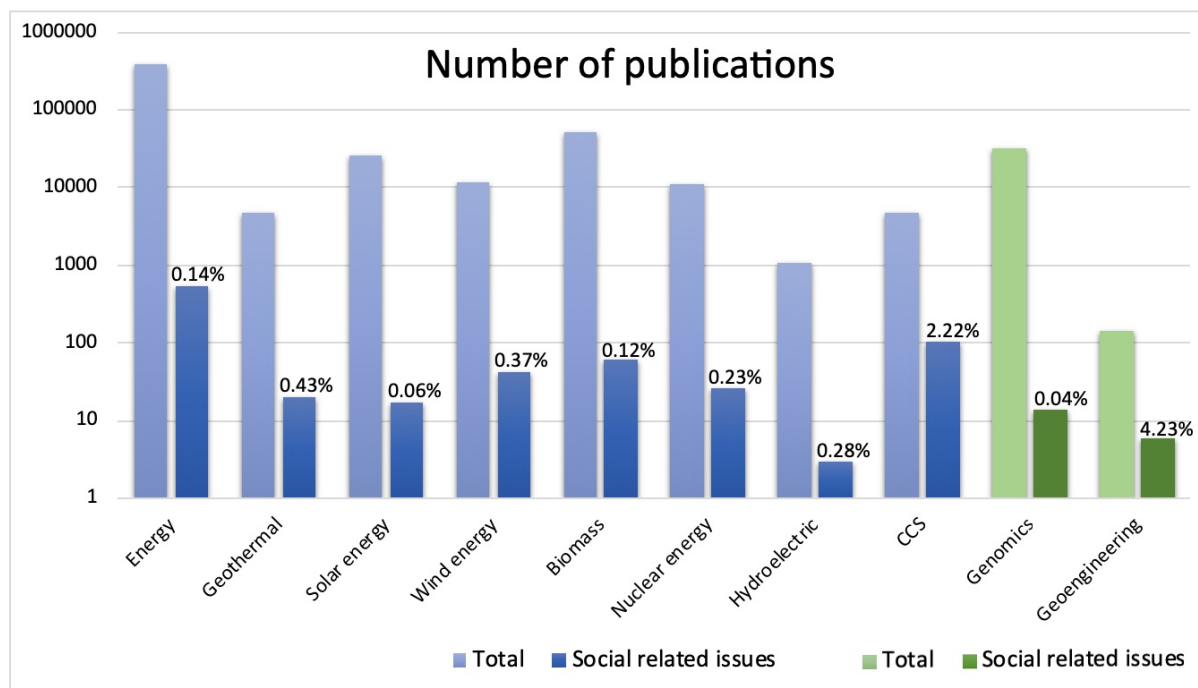


Figure 1: Results of a desk research in ScienceDirect in the timeframe 2008-2018. We searched articles containing - in keywords, in abstract or in title - the word referred to the technology (e.g. “geothermal”) together with one of the following: “public engagement” or “social aspects” or “public perception” or “social acceptance”. Number of publication in log₁₀ scale, energy topics in blue, other topics in green. Data Source: ScienceDirect 2008-2018. From Manzella et al. (2019).

paper, which is based on the collection of 11 Country case studies of public engagement with geothermal energy, is to contribute to the development of a common, synthetic framework for participatory geothermal governance.

2. GEOTHERMAL ENERGY AND PUBLIC ENGAGEMENT

The importance of public engagement activities with new energy technologies is recognized also at the institutional level. For example, in Europe, the European Strategic Energy Technology Plan (SET Plan) describes 1) understanding the behaviour of social and political actors and facilitating and 2) enabling public participation in the energy transition as two key actions in order to accelerate and strengthen the socially sustainable path towards a low carbon society.

At the same time, concrete projects and initiatives revolving around energy and society are flourishing, as it is the case of Journal Energy Research & Social Science¹, UK Energy Research Centre² or Berlin Social Science Center (WZB) Conference³. However, social science and public engagement still represent

minor issues in the domain of energy research. Searching in ScienceDirect⁴ the number of papers related to various energy technologies and other innovative scientific sectors (i.e. genomics and geo-engineering) in the last decade (2008-2018) we found that, in general, social science and public engagement represent a very minor part of the technology-related literature (as also highlighted in Sovacool 2014). With regards to geothermal energy, the rate of socio-related publications over the total number of articles scores third (0.43%), after geo-engineering (4.23%) and carbon capture and storage (CCS, 2.22%) technologies (see Fig. 1).

Beside a growing, but still limited amount of social studies within the energy sector, it is important to stress that public engagement can be considered from different perspectives - behavioural change, social acceptance, grassroots innovation – resulting in a fragmented picture. This is the case also for geothermal energy. The authors edited a book entitled *Geothermal Energy and Society* (Manzella et al 2019). It was the first book of its kind and, besides offering an up to date overview on geothermal energy and related social and economic aspects, the book presented a collection of 11 selected case studies from across the globe. It is referred as “book” in the following. The book is the outcome of a highly

¹<https://www.journals.elsevier.com/energy-research-and-social-science>

²<http://www.ukerc.ac.uk/publications/public-engagement-with-energy.html>

³<http://www.leibniz-energiewende.de/konferenzen/2018-breaking-the-rules-energy-transitions-as-social-innovations/>

⁴A leading search engine of peer-reviewed scholarly literature with over 3,800 journals and more than 37,000 book titles

interdisciplinary collaboration between fields of expertise and countries involved.

3. METHODS/THE BOOK

The volume is organized into three sections:

- 1) an introductory block;
- 2) a collection of case studies worldwide;
- 3) a conclusive chapter.

The first part introduces to the main topics – geothermal energy technologies and policies, public engagement and social studies – treated by the book, in order to enlarge and diversify the potential audience and to bridge the interests of readers with different background. The scope of the introduction is to foster mutual learning among key stakeholders in order to build a dialogue among researchers from different disciplines, operators, policy makers and civil society organisations. Chapter 1 provides an up-to-date overview of geothermal terminology and technology.. Policy and regulation adopted in Europe and regarding geothermal applications are described in Chapter 2. The perspectives of companies working in the geothermal energy field, including the Corporate Social Responsibility approach are the focus of Chapter 3 and Chapter 4 provides a comprehensive framework on the different perspectives to incorporate any societal actor in the process of technological innovation.

Chapter 5 prepares the readers towards the transition to the second block of the volume, which is the collection of 11 country-based case studies assessing the relationship between geothermal developments and societal engagement in different parts of the globe. Two case studies are based in Oceania Australia (Carr-Cornish et al 2019) and New Zealand (Luketina and Parson 2019), two in Asia Philippines (Ratio et al 2019) and Japan (Yasukawa 2019), one in North America Quebec, Canada (Malo et al., 2019) and six in European countries: France (Chavot et al., 2019), Greece (Karytsas et al 2019), Iceland (Jónsson et al 2019), Italy (Pellizzone et al 2019), Switzerland (Ejderyan et al 2019) and Turkey (Prill 2019).

As editors, our first effort was to map the experiences of public engagement with geothermal energy and to choose among them in order to include as much as possible the largest diversity in terms of technical, geographical, cultural, social and political perspective. Most of the country specific chapters report upon social scientific initiatives that have been carried out in each country; all of them were purposely written for this book and were structured around a minimal agreed common matrix. The diversity of the collection also depends on the wide range of disciplinary backgrounds of the co-authors who accepted to contribute to the book, some of them having more technical profiles and some others focusing on social sciences and innovation studies (Manzella et al, 2019).

The final part of the book attempts to bring together all the country profiles and cases studies within a concluding Chapter. The scope is to synthesize and derive input into policy-making starting from a comparison of the different case studies based on a series of key elements/questions: 1) What are the public engagement methods and initiatives in place? 2) What and who prompted social scientific research on geothermal energy and society in that particular country? 3) What were the results and if and how they are implemented in policymaking for energy innovation? 4) What levels of knowledge about geothermal energy from the general public and what are citizen and other stakeholders' perceptions and needs around this issue, also with respect to participation? (Allansdottir et al 2019).

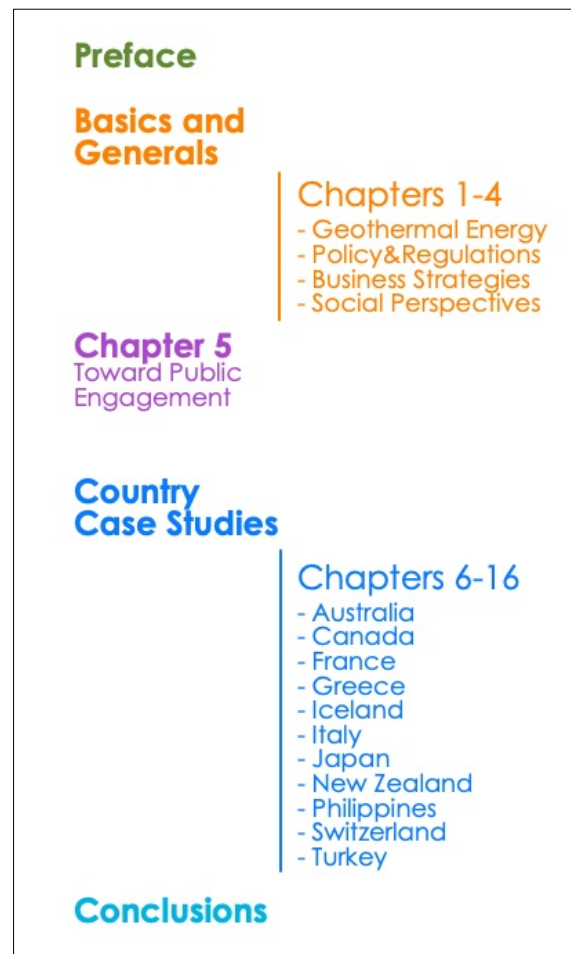


Figure 2: Book's structure.

4. LESSONS FROM THE PAST, IDEAS FOR THE FUTURE

As is often the case in many different fields of research and innovation, what drives societal concerns towards new technologies or new plants siting in the case of energy are societal perplexities over the use, governance and management of those technologies while the technologies themselves or as such are rarely objected. This is true also for technologies that harvest geothermal energy resources and this is why the relationship between geothermal energy and society, or more broadly the relationship between the

transition towards a sustainable low carbon energy future and societies is underpinned by a myriad of issues spanning different disciplines and bringing into play different actors. Providing answers to the numerous questions that inevitably arise is out of the reach of the book, but we hope that it might be of some help for further research and reflections in this field and that it can contribute to the construction of an international framework for public participation with geothermal energy.

According to our views as editors of the book, besides a series of methodological suggestions, three main groups of policy implications emerge from this work.

The first regards the need of *interdisciplinarity and societal dialogue among different stakeholders*. The need of bridges between competences and roles is fundamental in order to improve the innovation process and to find a balance between many – and often conflicting – perspectives. This might also require *new “places”* in which different actors (i.e. researchers from different disciplines, policy makers, public engagement practitioners, industries and civil society organizations) can meet, carry on mutual learning exercises and interdisciplinary discussions on energy technologies and energy transition. This might include multi-stakeholder on-line and off-line communities – such as platforms, citizen’ hubs, open research centres, etc. – considering both global and local dimensions. (Manzella et al 2019).

A second policy implication emerging from the book regards *processes of communication*. This consideration emerges from the fact that geothermal resource is simply much less familiar to the general public than other renewable technologies (Eurobarometer 2011). The debate around geothermal technology is shrouded by uncertainties and in some cases the public itself is asking for more information. In this regard, it is important to make a distinction between public communication on one hand, preferably carried out by independent and impartial experts, and communication activities provided by private companies on the other hand. As emerges from this book, it is clear that the former in particular needs to be strengthened and this necessity is highlighted by citizens but also other key stakeholders. This point is extremely important because in some case studies citizen’ requested for more information in order to properly participate to the debate. Another important input that we gather from some case studies is that scientist in universities and public research centres are regarded as the preferred source of information in comparison to companies’ experts, decision makers and journalists. To translate these results into policy actions, we could say that according our research, it would be particularly valuable to educate, prepare and support scientists and researchers in providing accurate, easy to access and organised information for the public and other key stakeholders. This means that curricula in the field of communication of science should be provided to students and young researchers,

and that professional and economic resources for communication should be strengthened within research organizations working in the geothermal sector (Manzella et al 2019). Some interesting pivotal actions are emerging for this scope, for example The Geothermal Resources Portfolio Optimization and Reporting Tool of the US Department of Energy (Young and Levine 2018).

A third lesson that stems from the experiences collected in the book is that public engagement initiatives are particularly pressing within the geothermal field. On the one hand participatory activities should be improved and based on a reasoned framework for public engagement with the energy transition. On the other hand, they should *be strengthened and reinforced through adequate levels of public funding* in order to develop consolidate forms of dialogue that facilitate the alignment of innovation with social needs. Public engagement in the energy field is not only a matter of social acceptance, but it is about taking into account different stakeholders views and co-creating the future together with citizens and society as a whole. As we wrote in the conclusion of the book, “the final goal is to embed social needs, perplexities and expectations within arena of responsible energy choices, fostering the participation of a scientifically literate society, enhancing diversity, stimulating collective intelligence, furthering mutual understanding and mutual learning among different stakeholders in research design and results” (Allansdottir et al 2019, p. 287).

Some novel and interesting approaches are also emerging in this field. Beside the institutionalised framework Responsible Research and Innovation (RRI) at the European level, the concept of Geoethics that deals with the ethical, social and cultural implications of geoscientific research, including geothermal energy (Meller et al 2017), is also gaining ground. The European Commission has also endorsed some other initiatives as it is the European Technology & Innovation Platform on Deep Geothermal (ETIP-DG) (Pinzuti et al 2019). The platform consists in an open stakeholder group with the scope of involving an increasing number and variety of stakeholders in order to work also on non-technical aspects of geothermal energy, including societal issues. Our impressions as editors of the book is that new organizational arrangements for public engagement focusing on the energy transition would be highly beneficial for all societal actors (Manzella et al 2019).

To conclude, new places for proper multi-stakeholder engagement, communication and dialogue should developed and supported at different levels, from local to global. We hope that our book will contribute to the design of future collaborative research on the societal aspects of geothermal energy and of public engagement initiatives within the energy sector, as a

successful transition towards a low carbon future for all.

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