Public engagement with geothermal technologies: framing the debate around subsurface energy

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Gustav Klimt, Burgtheatre, 1888
Geothermal energy uses

Heat/cool and electricity production
Distributed plants/centralized plants
Public scrutiny

- Contributor to a renewable and sustainable future
- Older than solar and wind
- Low levels of knowledge
- Potential for social conflicts → Tuscany

Environmental concerns
- pollution (water, soil ad air)
- induced seismicity
- health impact
- land management

Trust and value related issues
- distrust towards decision makers
- distribution of benefits and costs
- public good vs private interests
- local traditions
Improving the innovation process

- Take participation into account seriously (not only a catchy word)
- Improve transparency and trust
- Citizens are co-producers of knowledge
- Higher quality of innovation

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Environmental and social aspects of geothermal energy in Italy

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Two Italian case studies

1. VIGOR Project
   Assessment of the geothermal potential of Southern Italy. TERMINI IMERESE (SICILY)

2. ATLANTE GEOTERMICO DEL MEZZOGIORNO Project
   Map of the geothermal favourability of Central and Southern Italy. VITERBO (CENTRAL ITALY)
Social acceptance

- Socio-political acceptance
- Market acceptance
- Community acceptance

- Consumers
- Investors
- Intra-firm

- Of technologies and policies ...
- ... by the public
- ... by key stakeholders
- ... by policy makers

Procedural justice
Distributional Justice
Trust

The triangle of social acceptance of renewable energy innovation
(Wüstenhagen, Wolsink and Bürer 2007)
Our approach: public engagement

DEFICIT MODEL
Oppositions raise from a lack of knowledge → the solution was planning one way/top down communication from experts to non-experts (Public communication)

PUBLIC UNDERSTANDING OF SCIENCE
Analyses of a set of attitudes → mainly consisting in gathering the information from the public to the experts (Public Consultations)

PUBLIC ENGAGEMENT
Dialogue model → communication is considered a multidirectional exchange of knowledge, that is co-produced (Public participation)
Responsible Research and Innovation (RRI)

- Policy Makers
- Research Community
- Civil Society Organisations
- Business & Industry
- Education
- Science
- Education
- Ethics
- Gender Equality
- Open Access
- Governance
- Public Engagement
- Inclusion
- Anticipation
- Reflexivity
- Responsiveness
The two case studies: mixed methods
Termini Imerese and Viterbo

QUALITATIVE

• 4 focus groups: students, politicians and experts of the energy issues, common citizens of the involved areas, unemployed workers (Palermo)/environmental activists (Viterbo).

• each focus group: 8 participants, 1 facilitator and 1 observer duration an hour and a half.

• discussions were registered and the content transcribed and analyzed.

QUANTITATIVE

• survey: 13 closed questions.

• phone administration.

• sample population: 400 citizens living in the Palermo/Viterbo Province.

• calibrated by socio-demographic variables (i.e. gender, age, education, job condition).
Which one of these technologies will have positive, negative or no effect on our way of life in the next 20 years?

<table>
<thead>
<tr>
<th>Technology</th>
<th>Palermo</th>
<th>Viterbo</th>
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<tbody>
<tr>
<td>Solar Energy</td>
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<td>86</td>
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<tr>
<td>Wind Energy</td>
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<td>Nanotechnologies</td>
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<tr>
<td>Nuclear</td>
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</table>
Knowledge and information

**Palermo**
- No: 83%
- Yes: 17%

**Viterbo**
- No: 58%
- Yes: 42%

Italy (25%)
Europe (47%)
Finland (94%)
Bulgaria (17%)
(Eurobarometer on CCS, 2011)

**How much do you trust the following as information sources on geothermal energy?**

- **Very much**
- **Much**
- **Partially**
- **A little**
- **Not at all**
- **Don't know**

<table>
<thead>
<tr>
<th>Information Source</th>
<th>Very much</th>
<th>Much</th>
<th>Partially</th>
<th>A little</th>
<th>Not at all</th>
<th>Don't know</th>
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<td>Universities and Research council (Palermo)</td>
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<td>Journalists and media (Palermo)</td>
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<td>Local governments (Palermo)</td>
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Main results

Low levels of knowledge:

→ Information ↔ Participation

→ Low levels of knowledge → trust as a substitute for knowledge

→ Openness towards geothermal energy but distrust in the decision makers and developers → opposition

Similar pattern of results but also very clear differences related to the social, cultural and economic context. For example

Termini Imerese: geothermal technologies are perceived as fitting with the local industrial tradition and as a potential employment opportunity.

Viterbo: key argument was the issue of water contamination (high arsenic concentration).
“Geothermal energy and society”, a book

Figure 2. Global distribution of geothermal applications (heat producing countries in red, electricity producing countries in yellow. Stripes indicate production of both heat and electricity). Countries described in our case studies are highlighted by purple pins. Data Source: Lund and Boyd 2015, Bertani 2016
An open stakeholder group under the Strategic Energy Technology Plan (SET-Plan)

It brings together representatives from industry, academia, research centres, and sectorial associations.

Objective: to enable deep geothermal technology to proliferate and reach its full potential everywhere in Europe.

Among 5 Working Groups, one on non-technical aspects, including social

European Strategic Research Agenda for deep geothermal for the next decade(s)

TOPIC: Public and other stakeholder’s engagement

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Thank you!

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