



**Fostering  
constructive  
interactions with  
the public during  
geothermal projects**

**GE  ENVI**

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## Fostering constructive interactions with the public during geothermal projects

Geothermal energy has similar social acceptability issues as other renewable energy technologies. The territory of a geothermal project should be known in depth, understood and respected, including the public and its value, the energy issues and the entire socio-economic and political context as well. This knowledge can only be acquired with the tools provided by social sciences. It will be the key to build a project adapted to the territory, to communicate with and engage the public in a suitable way. Three tools helpful in fostering constructive interactions with the public have been examined: information sharing, creating local benefits, and public participation.

### Information sharing

The availability of reliable information on geothermal utilisation can be crucial when it comes to the public acceptance of geothermal projects as well as for comparison to other renewable energy projects. Official statistics and industry statistics on geothermal are often inoperable and fragmented<sup>1</sup>. In many countries, statistics on geothermal are not collected systematically, often because the utilisation is considered too small to devote resources to the collection, and so estimates or other, often inaccurate, methods are used. This can prove to be problematic for the geothermal industry when there are no reliable statistics to use for research or the promotion of geothermal energy as a reliable energy source. In addition, the statistics and information collected are not easily available or even very difficult to access, and the lack of data can be interpreted as a lack of transparency.

In light of this, the GEOENVI partners decided to review the status of information sharing across some of the partner countries. A template was set up for all the countries of relevance to complete (see the Annex of the GEOENVI report D4.2 “Compilation of Recommendations on environmental regulations”<sup>2</sup>).

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<sup>1</sup> <https://orkustofnun.is/gogn/Skyrslur/OS-2015/ERA-NET-International-Collection-of-Geothermal-Energy-Statistics.pdf>

<sup>2</sup> [https://www.geoenvi.eu/wp-content/uploads/2021/04/D4.2-Recommendations-on-environmental-regulations-GEOENVI\\_300421.pdf](https://www.geoenvi.eu/wp-content/uploads/2021/04/D4.2-Recommendations-on-environmental-regulations-GEOENVI_300421.pdf)



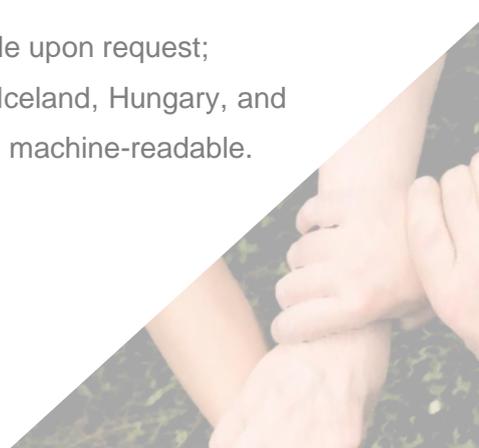


The analysis of the collected data showed several similarities:

- Exploitation data are generally confidential in Italy and France until the end of license/concession. In Iceland, the data are confidential unless stated otherwise in the license; in practice, the licenses have stated that the data are public unless the license holder requests confidentiality;
- All countries have a national framework, and all are mandatory;
- Exploration data are generally available, usually in the form of reports;
- Iceland and Italy publish available exploitation data (at the end of concessions if applicable);
- Flanders (Belgium), Hungary, Iceland, and Italy publish data online through interactive websites and map portals;
- Generally, the public is not aware of the available public data in France, Iceland, Hungary, and Italy;
- Data are considered trustworthy in Iceland, Italy and Hungary.

There are, however, also many differences:

- Iceland has an independent appellate committee on information matters, which Hungary, France, and Italy do not have;
- There are different data sharing practices on public data availability;
- The typology of data collection between countries is variable;
- In France and Belgium Flanders, the information is only available upon request;
- The amount of data available among the countries is variable. Iceland, Hungary, and Italy report data in tables and PDFs. They are not, at this stage, machine-readable.



## Case studies and good practice

Identification of available good practices from the countries was mainly from Hungary, Iceland, and Italy. **Iceland** publishes exploitation data annually, which is mostly used by experts; it includes volume produced, volume consumed, energy extracted in TJ, the temperature of the used fluid, and more. Currently, the data is published in tables and PDFs, but a more interactive portal is under development to improve data accessibility for the public. All publicly funded reports and data are available online. The available data are considered trustworthy and understandable.

For **Hungary and Italy**, the available data are also considered trustworthy and understandable, and web tools are used to make the public more aware and ease access to the available data. In Hungary, a fundamental step was taken in sharing information with the up-to-date and reliable geological, hydrogeological and geophysical data and information about Hungary's geothermal energy resources *via* a publicly accessible web-site, also in full English version<sup>3</sup>. In Italy, most public data refer to air quality and emission data.



## Recommendations

### 1. Defining a European standard on information sharing

Transparency (pros and cons) should be promoted, allowing comparisons. The standard should contain a minimum amount of information, but countries are encouraged to go even further in sharing information with the public.

The adoption of project management tools like the GSAP that has proven its use in Iceland on geothermal projects (see Theistareykir<sup>4</sup> and Hellisheidi<sup>5</sup> power plants) may improve data consistency.

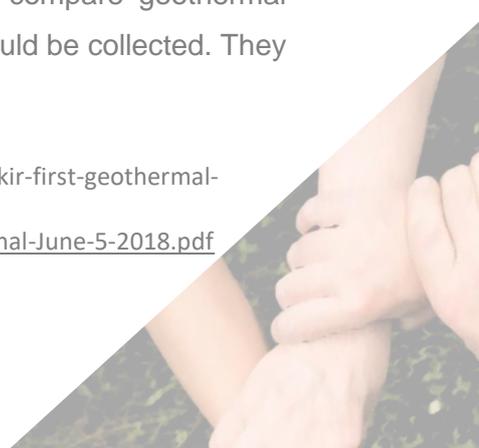
### 2. Selecting relevant information

The public should not be overloaded with information, and a balance should be found between confidential and non-confidential data. The collection should start before the development and include mitigation measures and positive impacts. Systematic data collection may help to improve the quality of data that is being published. To be able to compare geothermal utilisation to the utilisation of other energy media, comparable data should be collected. They

<sup>3</sup> [https://map.mbfisz.gov.hu/ogre\\_en](https://map.mbfisz.gov.hu/ogre_en)

<sup>4</sup> <https://www.landsvirkjun.com/company/mediacentre/news/news-read/theistareykir-first-geothermal-power-plant-to-undergo-gsap-sustainability-assessment>

<sup>5</sup> [https://www.dv.is/wp-content/uploads/2018/06/Hellisheidi-Assessment-Report\\_final-June-5-2018.pdf](https://www.dv.is/wp-content/uploads/2018/06/Hellisheidi-Assessment-Report_final-June-5-2018.pdf)



include: the extracted energy in TJ (requires data about flowrate and temperature); the produced energy per category; a distinction between primary activity producers and auto-producers, and a reasonable estimation where data are not collected.

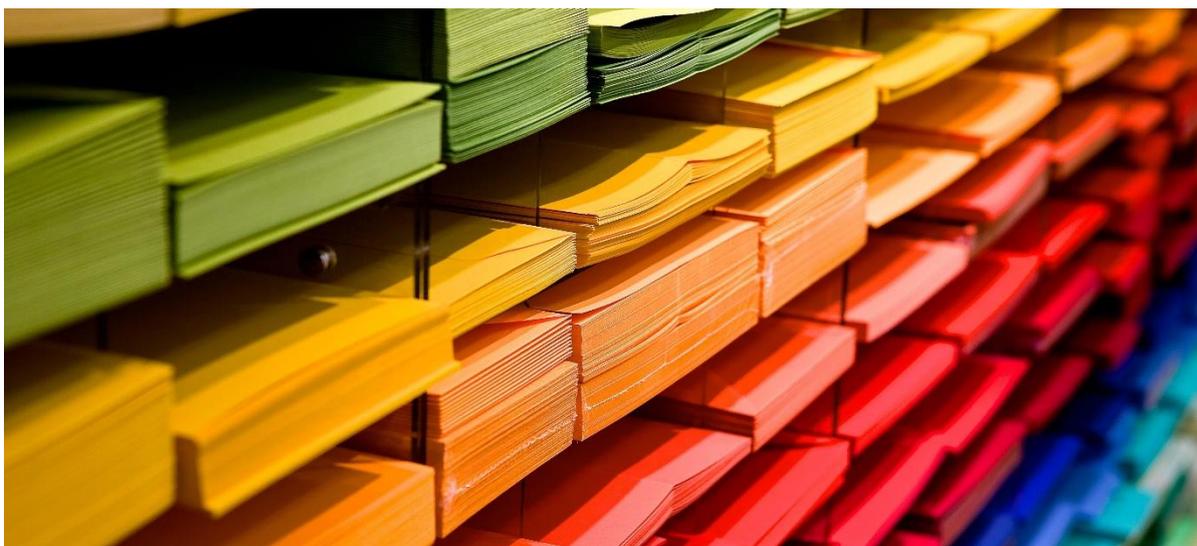
The systematic collection also implies adopting FAIR (Findable, Accessible, Interoperable and Reusable) principles in data management. Particular attention should be given to providing detailed metadata and storing data in repositories that guarantee long-term preservation to data.

### **3. Adapting the communication to the target audience**

Mediation work is needed, and clear terminology should be adopted. Also, the best dissemination support should be chosen according to the target group.

### **4. Improving data sharing and accessibility of information**

In some countries, data are only available upon request; therefore, it is recommended that data should be made FAIR and open (i.e., published online) for easier access by the public. According to Iceland's experience, the data that seems most beneficial to the public are energy extracted in TJ, flowrate, volume used per usage category (see categories used by Eurostat, IEA, and other organizations that collect statistics), and tariffs. When requests for information are denied, the possibility to appeal to an independent committee, such as in Iceland, is recommended. An experience, as in Iceland, shows that the sharing of reliable information and data is very important in order to gain public acceptance.



## Local Benefits

Geothermal development implies a series of positive impacts since energy production from a local, renewable, and low carbon source contributes to climate neutrality and the efficiency of processes, reduces energy dependence, and boost competitiveness, resilience, and utility for citizens and society.

An aspect of the relationship between the technological harnessing of geothermal resources and the societies and local communities in which these developments occur is the creation of local benefits and valorisation of those directly connected to the development. Moreover, grassroots energy innovation should be involved in any energy development. Guidelines and regulations may provide important pillars for embedding the local benefit aspects in the geothermal energy governance.

Various actions towards these objectives are visible at the local level. Some main examples collected among partner countries (France, Iceland, Italy) have shown that there are many different ways to enhance the local sharing of deep geothermal benefits (see the Annex of D4.2 for details). For example, all three countries provide financial support to geothermal district heating projects; however, nature (national vs. regional funding, administrative funds or derived from royalties) and organization of the financial support (loan, total or partial funding) is somewhat different. It should also be noted that local benefits such as territorial attractiveness and tourism, an increase of available jobs, and royalties-derived funding for local municipalities are available in any geothermal project. However, there is not clear information on these aspects in most European countries, and in general at the global level. Following the studied examples and the debate among partners and during the national workshops, a list of recommendations has been prepared; a local experience, such as the one of Tuscany in Italy, of using a part of royalties for supporting research and communication activities, and for promoting the uses of RES (renewable energy sources) technologies, including geothermal application, has given further hints for the proposed recommendations.



## Recommendations

### 1. Establishing a Fund derived from taxes to support the local communities

The Fund should promote a local economic development beyond the usual use of royalties and the direct benefits of geothermal projects that produce royalties, and could also be used to fund or co-fund activities of Recommendations 2 and 3.



However, it is encouraged to use the Fund to promote renewable energy technologies' applications and improve environmental control of the area, such as shallow aquifers, local ecosystems and surface waters (this topic links to *Aquifers' interconnection* and *Discharge of geothermal fluids*).

## 2. Supporting local utilization of geothermal heat

Utilization of geothermal heat for heating and cooling of spaces and processes, in series or as cascade heat in the main geothermal projects, or as independent, small projects, aims to create a circular and co-designed use of local geothermal resources. The involvement of SMEs should be encouraged.

## 3. Establishing a plan for valorising local benefits

The plan should cover:

- a periodical registration of the contribution of geothermal development to the economy of the nation/region/province;
- communication of geothermal information, including those related to activities funded by Recommendation 1, those related to Recommendation 2, and those of the data registry (the previous point);
- training and educational activities to foster local applications should be also encouraged at local and national level.

The registry should include:

- the number of jobs involved in the geothermal development, both those directly linked to the sector and indirect jobs in projects supported by geothermal development or associated activity (e.g., those established in Recommendations 1 and 2);
- the environmental benefits, such as avoided GHG emissions both for local and national level;
- the economic benefits such as cost reduction (life cycle cost) of heating, avoided imported fuels, geothermal revenues.





## Public participation

Before a deep geothermal project is granted a development consent<sup>6</sup>, the public must be given the opportunity to be informed and express its opinion. EU legislation on public participation foresees that the member states determine how they wish to inform the public<sup>7</sup>.

<sup>6</sup> or in other words the decision by which a project can or cannot take place

<sup>7</sup> *“(a) the public is informed, whether by public notices or other appropriate means (...), about any proposals for such plans or programs or for their modification or review and that relevant information about such proposals is made available to the public including inter alia information about the right to participate in decision-making and about the competent authority to which comments or questions may be submitted;*  
*(b) the public is entitled to express comments and opinions when all options are open before decisions on the plans and programs are made;*



Based on this overarching legal obligation of public participation, which takes place with the legal inquiry<sup>8</sup>, two questions have been asked:

1. How is the legal obligation to inform the public organized among the GEOENVI countries?
2. What is the reality/quality of the communication between the public and the operators established by those tools?

Flanders (Belgium), France, Hungary, and Italy partially responded to a survey, and the subject was discussed during the 2<sup>nd</sup> round Italian, Hungarian and French workshops. It is important to note that the source of information was mainly operators and experts (completed with other stakeholders' inputs from the workshops, and some literature for France). The way “geothermal energy managers” understand participation differs from the way the residents understand it (Ruef and al., 2020), so this impacts the recommendations.



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(c) in making those decisions, due account shall be taken of the results of the public participation”. Art2 Directive 2003/35/EC. Retrieved from: <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32003L0035&qid=1599480899608&from=FR>

<sup>8</sup> Other formal or informal tools can be used by the operators or authorities to complete this minimum legal requirement



**Legal obligation to inform the public (public inquiry) in the GEOENVI countries**

1. Form of the legal obligation to inform the public: the public inquiry (or through a request for development consent presented with the Environmental Impact Study in Italy)
  - 30 to 90 days;
  - Not always an investigating commissioner (in Iceland, the National planning agency is in charge, in Hungary it is the notary of the respective municipality, in Italy the permitting authority);
  - Information has to be made available (the choice of the medium is free, as well is – at least partially - the content);
  - Formal collection of the comments and questions from the population.

**2. Public information/participation in a deep geothermal project-timeline**

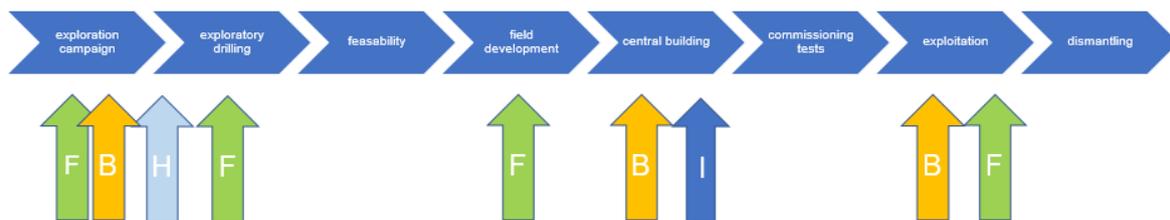
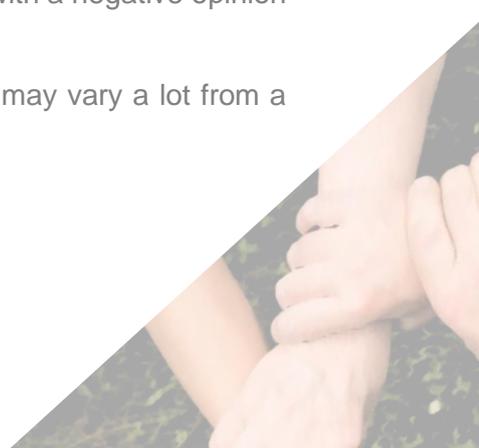


Figure 6 Diagram resuming different timing and occurrence of the public inquiry at the national level in the GEOENVI participating countries. B: Belgium, F: France, H: Hungary, I: Iceland

**Quality of the communication between the public and the operators**

Scholars in France have demonstrated that the public inquiry does not necessarily reflect the population's position on a project. The public participation may vary a lot from a project to another (Chavot & al., 2016) and could be very low, which questions its representativeness. The opponents can remain silent or choose other ways to express their opposition, like litigation (Baggioni, 2014). “Their function [of the public inquiries] seems to be more to satisfy legal requirements [...] than to encourage public participation” (Blatrix 1996, quoted by Chavot & al. 2019). It questions the purpose of public inquiry tool: it may not be to mobilize the maximum of people to express their opinion but to avoid open conflicts and reach a consensus, even if feeble, or just to fulfil the legal requirements (even with a negative opinion of the investigating commissioner, authorities may accept the project).

- Low participation of the population (Hungary, Iceland, France: may vary a lot from a project to another (Chavot & al., 2016));



- Difficulty to communicate “[...] the apparent misunderstanding between citizens who feel poorly informed - even misinformed - and project promoters who think they appropriately communicated” (France, P. Chavot: For example, he observed “[...] when the project’s advocates are claiming that they are limiting the risks, local residents are drawing the conclusion that these risks actually do exist.” “For the promoters, the precautionary principle means that the risks are under control, while for the residents, it should be used to postpone the projects”);
  - Difficulty to take into account the opinions expressed, sometimes “unconstructive” (Hungary), on a very engineered object (impression that there is not a lot of practical options to be discussed);
- ⇒ The public inquiries can reflect a feeble consent or be a “platform for protests” (France (Chavot & al.2019), for the Enhanced Geothermal System (EGS) technology, which is more controversial than the conventional deep geothermal activity developed in the Paris Basin), it is a common democratic issue. Each project has its specificities (unique socio-technical object). The participation process seems to be satisfactory in Flanders on recent projects.
- ⇒ There are some specificities for geothermal energy:
- ⇒ Often unfamiliar to the public (sub-surface, technical, except for Iceland and “proto-expert” sometimes);
  - ⇒ Development of a geothermal project takes time (difficulty of long-lasting works, Hungary);
  - ⇒ Positive role in the energetic transition should be compared with other options and their advantages, disadvantages, implementation on specific territories.



## Recommendations

Recommendations are informed by the above analysis and complemented by the results from the 3<sup>rd</sup> round GEOENVI workshop on public engagement<sup>9</sup> (see deliverable D4.4<sup>10</sup>).

### 1. Fostering public engagement policies based on territorial integration

- The territory of a project should be known in depth, understood and respected, including the public and its value, the energy issues and the entire socio-economic and

<sup>9</sup> <https://www.geoenvi.eu/events/targeting-co-ownership-rather-than-acceptability-for-deep-geothermal-projects/>

<sup>10</sup> [https://www.geoenvi.eu/wp-content/uploads/2021/05/GEOENVI\\_D4.4\\_PolicyEvents.pdf](https://www.geoenvi.eu/wp-content/uploads/2021/05/GEOENVI_D4.4_PolicyEvents.pdf)



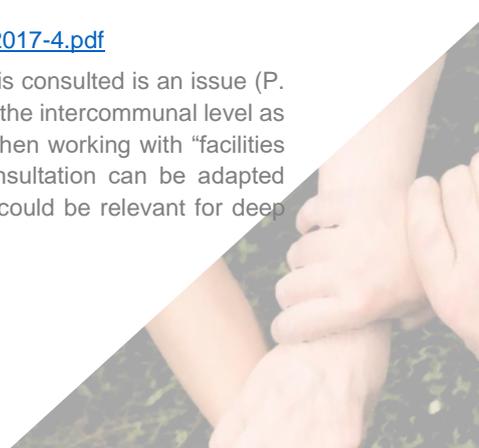
political context as well. This knowledge can only be acquired with the tools provided by social sciences. It will be the key to build a project adapted to the territory, to communicate with and engage the population public in a suitable way. This includes seeking project-based, dynamic communication, information, and participation processes adapted to local characteristics, and combining formal and informal means of communication with the local population.

## 2. Deepening of the participatory process and stimulating a quality dialogue between the project developers and relevant stakeholders

- Fostering the public participation (e.g., Geothermal project development incorporated in the primary and/or secondary school education programme (Hungary, Flanders), site visits), go further than the legal minimum requirements (with stakeholder committees, pre-project consultation .... Formal and informal tools), with a transparent and harmonized protocol;
- Improving communication both way (e.g., Wind energy in France: a “package permit” based on “variable features” (number, power, location of wind turbines) was tested offering different scenarios to the population; transparency in Iceland), and mutual knowledge (e.g., need to understand the stakeholder risk perception underlined in Italy);
- Protocols like the Geothermal Sustainability Assessment Protocol GSAP<sup>11</sup>, modelled on the Hydropower Sustainability Assessment Protocol and tested in Iceland, can help to take into account the environmental, social, technical, and financial issues in a transparent process;
- Accept the project to be questioned and take the opinions into account (e.g., additional testing for radioactivity in Flanders).
- Expand the perimeter of participation:
  - Geographic perimeter: reach the population actually concerned by the project (neighbourhood cities and intercommunal level<sup>12</sup>);

<sup>11</sup> <https://www.landsvirkjun.is/Media/gsap-theistareykir-assessment-reportfinal-3-may-2017-4.pdf>

<sup>12</sup> In France, the fact that only the population of the city where the project takes place is consulted is an issue (P. Chavot). The PI could take into account the population of neighbourhood cities or even the intercommunal level as the project impacts could go further than the administrative boundaries of the city. When working with “facilities classified for environmental protection” (ICPE), the perimeter of the population consultation can be adapted regarding the potential impacts of the facility. This flexibility regarding the perimeter could be relevant for deep geothermal installations.



- Governance perimeter: importance of the involvement of the local authorities<sup>13</sup>, if the general public is difficult to reach, some associations or other stakeholders can be involved.

### 3. Making communication an ongoing process since the very initial project phase

- An early communication on the project<sup>14</sup> is important, to be proactive;
- The process should be ongoing.

### 4. Promoting tools and approaches fostering public engagement and co-ownership like crowdfunding

- The participation process should create a proactive transversal informed dialogue with clear rules with all the relevant stakeholders, adapted to the territory, not only “addressing concerns” but presenting all the project dimensions and other energy options (their advantages, disadvantages, implementation on specific territories). This may be the way to create a consensus for geothermal energy development.
- It is important to move beyond social acceptability, towards a paradigm of co-ownership. Emerging approaches like crowdfunding<sup>15</sup> can help in that respect.

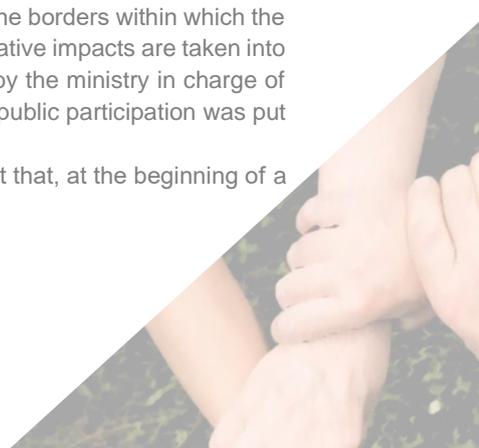
<sup>13</sup> In France, the consultation of the city councils of the concerned cities (in the AR, PER, concession, authorization for exploitation or authorization to open mining work) has just been introduced in the French system (decree of December 2019) which seems to go in the right direction. In an innovative engagement process for wind energy, the consultation of the local authorities takes place before the public enquiry and the city councils’ opinions are attached to the documentation of the public enquiry; It gives more visibility to the local authorities’ opinions and will invite them to be consistent and debate openly about the subject. This could be promoted in the geothermal sector too.

<sup>14</sup> In France, for the offshore wind farms, an innovative process has been put in place, as a try, by the public authorities and more especially the National Commission on public debate that could be a good way to address this issue.

A “package permit” is available (comprising environmental and exploitation authorizations and concession). It is based on “variable features” (number, power, location of wind turbine) that constitutes the borders within which the project can evolve without having to submit new authorizations. Maximum potential negative impacts are taken into account to realize the Environmental impact study. The impact study can be realized by the ministry in charge of energy itself. This documentation is the base of the PI and an innovative way to foster public participation was put in place (see [here](#), in French).

The “variable features” may be an interesting way to draw people’s attention on the fact that, at the beginning of a project, some parameters remain to be decided.

<sup>15</sup> <https://www.crowdthermalproject.eu/>



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This document is part of a series conducted in the framework of the GEOENVI project. Its aim is to respond to the need for harmonization of environmental regulations and to address concerns about potential environmental effects of geothermal projects in Europe.

GEOENVI strives to facilitate the incorporation of geothermal energy in Europe's energy transition, while respecting sustainability and creating a robust strategy to answer environmental concerns. The project developed a unique Life Cycle Assessment methodology for evaluating geothermal projects.