



CROWD THERMAL DELIVERABLE D1.4

GUIDELINES FOR PUBLIC ENGAGEMENT

Summary:

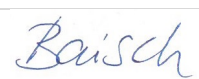



The report on guidelines for public engagement deals with the topics of why public engagement is important in geothermal energy projects, why a comprehensive planning of participation measures is crucial, and in this regard how a constructive communication strategy can serve risk and conflict prevention. The report then proceeds with suggestions on how to analyse the contextual preconditions of a project area and elaborates on the different phases and formats of public engagement. The recommendations are illustrated by examples stemming predominantly from case studies of the CROWD THERMAL Project.

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EXECUTIVE SUMMARY

Following the understanding of geothermal projects as social-technological systems and being aware that every new infrastructure means a significant change of the daily living environment, the importance of involving the public into the development and planning of geothermal projects becomes evident. The aim of this report is not to provide a recipe for public participation which would follow an instrumental understanding, but to sensitise for the nature of social-technical systems and the relevant questions in this respect. Thus, the analysis of the siting municipality and the planning of adequate participation measures should be paid more attention to than just to the chosen format in terms of public hearing, workshop, or planning cell.

The differentiated understanding of public engagement refers to the pyramid of participation including the four main levels information, consultation, cooperation, and agreement on the scope for action. According to the different levels of participation, the diverse goals and functions of participation are reflected. Creating acceptance is often seen as one goal, but this unidimensional view is too narrow and neglects further functions looking from a democratic, ethical, or transformative perspective. Additionally, a general need for participation in society can be seen as a current megatrend.

In order to find a match between the social-technical system related to the geothermal project and the participation measures chosen, a comprehensive analysis of several contextual factors is strongly recommended. Characteristics of place, the siting community and the respective stakeholder system including the political context as well as existing experiences should be taken into account. The report points out reasonable methods to analyse the context and provides correspondingly examples for participation formats that can be used in the different phases of a geothermal project, ranging from project definition to decommissioning & post-closure.

Finally, special attention is paid on the role of communication regarding risk and conflict prevention connected to participation procedures of geothermal projects. Likewise, the essential meaning of general rules of communication exemplified on the model of four sides of communication is pointed out.

1 INTRODUCTION

Dealing with human-made climate change is by far the biggest challenge facing humanity in the 21st century for all future generations. Five years after the Paris Climate Agreement in 2015 (Council, 2016), most EU member states are far from meeting the agreed climate targets. Decarbonisation of the energy system through a comprehensive energy transition is the key element to limit global warming to well below 2°C, better to 1.5°C. It must be possible to cover 80% of the countries' energy needs from renewable energy by 2050 at the latest (Council, December 2020).

The European Union's readjustment in December 2020 to stricter climate targets by 2030 (Council, December 2020) shows how urgently this matter is seen at the political level. A rapid implementation must follow the tightening of the strategy in action in each member state. Geothermal energy production can be an important factor in the implementation:

The benefits and versatility of geothermal energy find an increasing attention, because of its advantages like the independence of seasons or its diverse usability for electricity, domestic hot water as well as heating and cooling application.

Public engagement plays an essential role in geothermal energy projects as it is not only a relevant factor for public acceptance, but it can also be seen as a solution for the societal need of participation in environmental policy and as fulfilling a democratic and transformative function. Additionally, project development gains from using local knowledge and will be more efficient.

The following report addresses the importance of public engagement in geothermal energy projects, and illustrates how communication can contribute to risk and conflict prevention related to public responses coming up in the planning process. Central topics of this report are the contextual factors that must be considered in public participation strategies as well as the different phases and formats of engagement in geothermal energy projects.

Therefore, the report synthesizes results from the CROWD THERMAL-deliverables on public acceptance factors (D1.1), environmental factors (D1.2), experiences from the stakeholder analyses in the case studies of the CROWD THERMAL-project (D1.3). Additionally, the report integrates approaches and recommendations of existing guidelines for public engagement in geothermal and other renewable energy projects (e.g. Strober et al. 2017).

2 THE IMPORTANCE OF PUBLIC ENGAGEMENT FOR GEOTHERMAL PROJECTS

2.1 WHAT IS PUBLIC ENGAGEMENT?

The development of renewable energy such as geothermal energy is not just a technical matter. It is also very much a question of social change with impact on people's everyday lives regarding energy production, distribution and consumption (Ruef et al., 2019). The importance of including the public to development and installation of new energy infrastructure has been increasingly recognized in recent projects and also in the literature.

Participation and public engagement are synonym key words for this process of involving the public. In the following we present you a definition and overview of the relevant steps for public engagement.

According to Rowe and Frewer (2015) public participation is “the practice of involving members of the public in the agenda-setting, decision-making, and policy-forming activities of organizations/institutions responsible for policy development” (ibid., p.252). In the context of geothermal energy projects, a distinction can be made between the involving persons on the participatory side, usually politics or the project management, and the side of the participants, mostly referred to as the public or citizens (compare chapters [3.1.2 Community](#) and [3.1.3 Stakeholder analysis](#) for a more detailed overview).

Participation in the basic module means information exchange between members of the public and members of the project. Ideally it will lead to a negotiation that mutually influences and transforms the opinions and agendas of members of both - public and project related - parties. The more genuine and thus successful participation is to become, the more it is about a redistribution of decision-making power and a say on the part of the citizens to be involved. To cite Arnstein (1969): “*participation without redistribution of power is an empty and frustrating process for the [participants]*”. In this sense, “real” participation means at least cooperative approaches including sharing of power and joint decision making, so it goes beyond the levels of (only) informing and consulting the public.

In order to achieve a true redistribution of power within the bounds of possibility, the next chapter offers a more in-depth overview of the four possible levels of participation for renewable infrastructure projects.

2.2 PYRAMID OF PARTICIPATION FOR RENEWABLE PROJECTS

Based on the “Ladder of Participation” by Arnstein (1969) the following diagram visualizes the participation process as a “pyramid of participation for renewable infrastructure projects”.

It illustrates the levels of real participation for both relevant perspectives: the perspective of the involving side which is providing participation opportunities, and of the participants who are participatory involved in the project. The different levels of participation illustrated in the following diagram refer to the involvement in planning and permitting procures connected to geothermal projects but count also for financial participation.

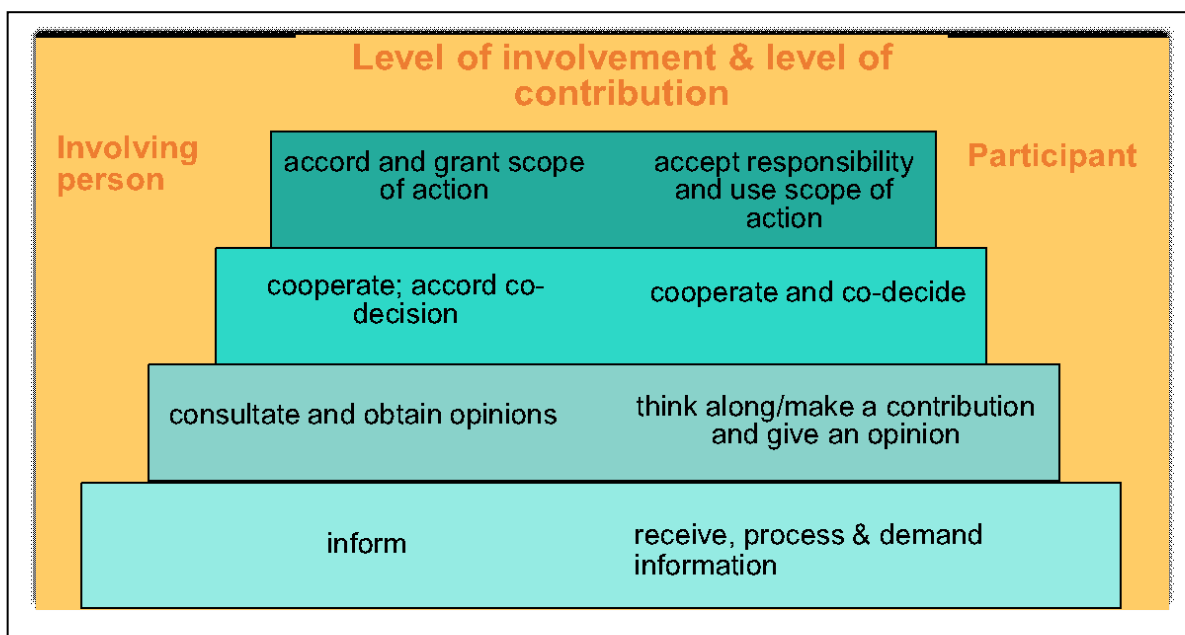


Figure 1: Pyramid of Participation, inspired by 'Ladder of participation' from Arnstein, 1969 (Rau, Schweizer-Ries, & Hildebrand, 2012)

2.2.1 Information

The communication of information is the first and perhaps most important step in participation. Here, information is initially defined as a one-way flow of communication and, strictly speaking, does not provide for any feedback or demand possibilities. Such opportunities for exchange take place at the next higher levels starting with consultation.

The project promoters provide the affected citizens at an early stage with an overview of planned project measures. This gives citizens a first impression of the planned project and allows them to process the information about the upcoming infrastructure project. Ideally, this and the accompanying cognitively activated, perceived effects on their own lives also make salient/available their own rights, responsibilities and options for participation in planning and implementation processes (compare chapter [4.1, Project Definition](#)).

This initial information before the start of the project is therefore important, but so is any further information that should be provided throughout all phases of the project. Information can be transported from the project promoters to the stakeholders¹ in different ways: written, verbal or visual, digital or analogue. In principle, the target group should always be considered in every information activity. For example, it is essential to convey information in writing, analogue and in the traditional way via the local press, as this is particularly appealing to older target groups. At the same time, digital offers, such as a project website or a project-related social media account, offer great potential to inform and provide visual content. That way a younger target group can be addressed.

To sum up: information is the basic building block for any further level of participation and should therefore be carefully and continuously pursued. However, informing and being informed alone is not enough.

2.2.2 Consultation

Information is an essential prerequisite for consultation. Within the framework of consultation, information and opinions are exchanged between involving persons or institutions like project promoters, and participants, such as stakeholders or affected residents. Dialogue-oriented procedures are used for this purpose. This can be a classic "town hall meeting", but can also include innovative formats such as site visits, school visits, workshops in smaller circles or stationary or travelling exhibitions. Digital exchange formats, e.g. a complaints box on the project homepage or FAQ sections on social media, can be used for consultation, too.

The exchange of information and opinions between participants and stakeholders is successful, when the participants feel being heard and taken seriously and the project promoters actually do. Successful consultation creates an important basis for further trust between the involved parties and is therefore very important for further communication and acceptance of the project.

¹ Stakeholders are understood in a comprehensive sense including a broad range of persons and institutions/ entities (see also D1.3):

- People who are directly or indirectly affected by the project (households and local communities)
- people or entities with decision-making authority over the project or that can otherwise influence or contribute to the outcome of the project (in a positive or negative way, not necessarily based locally – for instance national, regional, local regulators, NGOs, industry groups, community leaders, politicians and civil society organizations and media).
- People / entities indirectly impacted by the project or having a legitimate stake or interest in the project such as future employees and their families, future contractors, suppliers, competitors, financiers, etc.

2.2.3 Cooperation

In the course of cooperation, the circle of people involved and participating inevitably becomes smaller: In the process of cooperation, recommendations for the further course of the project should be drawn up at a round table from as many different perspectives as possible. For this purpose, it is important to communicate continuously with a defined number of people. It makes sense to specifically invite people from the following reference groups to the cooperation table: direct residents, representatives of initiatives, clubs and associations involved in the project and representatives of interest groups such as senior citizens' advisory boards, sports clubs or allotment gardeners (compare chapter [3.1.3 Stakeholder analysis](#)) Often, only those people who see the negative consequences of the project get involved. Therefore care should be taken to ensure that people, who will benefit from the planned project, are also involved.

To ensure the efficiency of the working group and also in a sense of transparency, it should be clearly stated from the beginning which recommendations can be taken into account in the further course of the project (and which cannot). This definition of objectives can often avoid fundamental discussions (discussions may switch from "Does the location of the plant make sense" to "Do the geothermal projects make sense in principle").

Even if the participation process is designed to be as open-ended as possible, there are limits to what can be negotiated. These limits usually lie in the technical planning and the target direction of the planned geothermal plant. For example, it will hardly be possible to negotiate with a project developer who is planning an expanded geothermal power plant for electricity generation to such an extent that he changes his plans and instead constructs a deep heat borehole for the purpose of heat generation, if electricity generation was the original goal.

These possibilities and limits of co-determination should be openly discussed within the framework of the partial participation procedures and the scope for action should be defined in advance. Within these jointly defined limits, efforts should concentrate on what is possible within the agreed framework for action. In this way, possible measures for action can be discussed in a targeted manner.

2.2.4 Agreement on the scope for action

After successful cooperation between project planners and stakeholders, there should be agreements and recommendations that can be implemented in the further project phases. These agreements must be written down (legally binding) and then adhered to.

The agreed concessions must be guaranteed by the project promoter and the citizens must accept their responsibility as far as possible, while at the same time accepting the limits of the scope for action.

If a consensual agreement on action measures does not work and a conflict with hardened fronts develops, conciliatory formats with external mediation should be used.

Once this idealised participation process has been successfully completed, the general public must again be informed about the agreements reached. Depending on the project phase and on any conflicts that may arise, the participation pyramid can be passed through again and again, or the participation process can stagnate at different levels on different dimensions.

2.2.5 Financial participation

Besides the involvement in the planning and permitting procedures of geothermal projects also financial participation opportunities play an increasingly relevant role for public acceptance. The following figure provides a short overview of different options and levels regarding financial participation, detailed descriptions and analyses are part of the work packages WP2 and WP5 of the CROWD THERMAL project.

Withdrawing money via Crowdfunding:

- direct funding in return for shares
- direct funding in return for a loan
- direct funding without monetary, but product rewards (like energy)

Direct lending:

- Regular: loan provided and funding gathered by financial institution
- Green Bonds: Money is specifically raised for climate and environmental projects
- Social Impact Bonds: Success financing instrument with flexible payment to investors dependent on achieved savings

Leasing:

- Operational: Institution pays project developers, developers pay back in periodic installments. At the end: Institution owns the facility
- Financial: Leasing company pays project developers, developers pay back in periodic installments. At the end: Facilities can be bought at an agreed price

Figure 2: Examples for different forms of financial participation, based on D5.1 Case Study Assessment Protocol.

2.3 WHY PUBLIC ENGAGEMENT

Why public engagement? The answer to this question lays the foundations for the conditions under which the public can participate in project planning and implementation - or not. Public

engagement is important for the acceptance of every geothermal project. But not only acceptance but a variety of other reasons play a role for the successful implementation of a project. The implementation of a geothermal project is certainly the main goal of the project, but at the same time the participation of the public also serves some higher purposes which are listed below.

2.3.1 Acceptance

The acceptance of energy infrastructure projects is the desirable status for all parties in the projects. Acceptance may build partnerships rather than to leave scorched earth behind a finished project. It is a common and mistaken assumption that public or individual knowledge about a construction project linearly influences the acceptance of it. A respectable amount of psychological studies show that this isn't the case: Acceptance is based on a rather complex and non-linear interaction of knowledge, experiences and other psychological factors (such as trust, perceived fairness, perceived behavioral control, norms and attitudes, see CROWD THERMAL D1.1 for more information). Public engagement can positively influence these various factors and is able to enhance the acceptance of a project (Huijts, Molin & Steg 2012). Therefore public engagement shouldn't be an eventuality but should be rather seen as an important backbone for the successful implementation of geothermal energy systems.

2.3.2 Environmental policy's need of participation

Environmental policy has a special position regarding the dialog with the public and public engagement: Partially current environmental strategies are invented because of public movements. Especially in today's political landscape we see the strong connection between broader citizens' movements and environmental politics just to name the Fridays For Future-movement as an example in Europe and worldwide. Environmentalism and decarbonization do not work without support by the public.

In order to implement energy system transformation as agreed in Paris in 2015 (Council, 2016), large-scale, sustainable infrastructure adjustments must be made, which should be jointly supported by all actors. Citizen engagement is therefore also about fundamental participation in energy system transformation and climate protection - the protection of living standards now and in the future by promoting decarbonisation, including in the energy industry.

2.3.3 Democratic Function – Participation as a self-purpose

Well-done participation involves all major stakeholders and many citizens in the discussion. It therefore is a chance to counteract the estrangement of parts of the society to their government or politics - which is currently being observed in Europe and around the world.

Participation, communication, factual discussion and implementation of actions may strengthen the belief and trust in the representative democracy and its bearing institutions.

2.3.4 Transformative Function

In order to draw the bow back to the conditions for the development of renewable energies: Citizens need to participate in the technical and social change that the energy transformation for the reduction of greenhouse gas emissions of mankind urgently requires.

Since energy production, distribution and consumption has an impact on people's everyday lives, the population must participate in the technical aspects (as much as possible). The participation itself can already serve as an impetus for social transformation. Successful citizen participation in energy infrastructure projects contributes to an institutionalisation of participation processes and thus to a transformation in the way the public is treated regarding renewable energy infrastructure projects.

2.3.5 Epistemic Function

Participation processes are learning experiences for all participants and especially for the planners of infrastructure projects. Much can be learned from initially unsuccessful participation attempts, so that instruments and strategies for participation can be refined for the future - and ideally these can also be institutionalized at the same time. Consequently, every successful participation process can contribute to the success of a further, future public engagement process.

2.3.6 Ethical Function

Last but not least, participation also has an ethical purpose. Participation accepts the citizen as a mature being who has the right to participate fairly in processes that affect his or her life. Often, participation is also about the (perceived) procedural justice between participants and those involved. Transparency, to communicate at eye level, to take civil objections seriously and yet not to lose sight of the larger vision of the project - in short: a cooperative togetherness - promotes mutual respect and can contribute to a more peaceful social life.

But despite all the reasons for participation, it should not be forgotten that attempts to mobilise the general public and thus also participation have their limits. The basic rule is: "The further away from everyday life a project (seems) to be, the less interest there is in participating in the project" (Bock, Reimann & Abt, 2017, p. 39).

2.3.7 Costs and benefits of participation

Public participation processes are not free and require resources: time, personnel and money. Surveys from previous participations show that well-done public participation can lead to a prolongation of individual project phases (Rau, Schweizer-Ries, & Hildebrand, 2012). In the long run, however, the overall process of planning and approving projects is shortened, especially since possible reasons for complaints can be eliminated in advance. Public engagement also requires human resources, expertise in dealing with different stakeholders and communication skills. Depending on who is leading the participatory process, whether a public authority or a corporate promoter, and on previous experience, it may be worthwhile to hire external experts. Large companies that have already gained experience with participatory processes often have a dedicated department and may not need external staff to plan participation.

Ultimately, participation also costs money. As a rule of thumb, about 1% of the planned project volume should be spent on public participation. Here it is important for the initiators of participation to determine in advance how participation and financing should be organised. This chapter and the guideline in its entirety should be convincing arguments that participation is worthwhile: on a material and immaterial level.

3 CONTEXTUAL ANALYSIS

As it becomes evident in table 1 of this report there are many different approaches to public engagement. They can differ in factors, such as the topics addressed, involved actors, duration and number of participants (Nanz, & Fritsche, 2012). The strategies that are typically used differ between countries and different strategies serve different goals (Nanz, & Fritsche, 2012). To decide which public engagement strategy to choose for a certain geothermal energy project it is important to consider the preconditions of the project. As shown in the model by Walker and colleagues (2011) there are many factors that play a role in public engagement and there are different methods that are suitable to assess these factors.

3.1 CONTEXTUAL FACTORS

Many of these factors are contextual factors (Walker et. al., 2011). For instance, the context includes the place and the community, the stakeholders, the historical context, the vision in the project area, the political situation and the existing knowledge on geothermal energy.

3.1.1 Place

The nature of the place and of the community affects public engagement by influencing the expectations and engagement strategies by the public (Walker et. al., 2011). The characteristics of an area, such as the residents' housing situation can be a substantial factor in shaping motivations to participate in an energy project. In the case study of the EAI310 Cooperative in Spain that used shallow geothermal energy for 220 houses, the need for affordable housing for families brought together a network of people who created a cooperative with the aim to build their own housing (CROWD THERMAL, D1.3). The fact that this cooperative consisted of people who knew each other already influenced the teamwork in the process of the project. In this way the housing situation brought together a group of people who initiated the project and thus, also shaped the character of teamwork between the stakeholders. This example illustrates how knowing the nature of the place in which a geothermal project might be planned helps to understand the residents' motivations and the stakeholders' relations to each other. In this way an appropriate method can be chosen as a possible engagement of the public with these stakeholders.

Another aspect of the place that is important to assess before starting a project is the nature in the project area. It should be researched whether there are protected spaces, nature reserves, national parks or whether there exist directives protecting flora and fauna in order to

avoid complications. It should be assessed whether the geothermal energy project could affect the landscape negatively as this might cause resistance among residents but also among stakeholders, such as those involved in tourism, environment and landscape protection. It could be useful to find out which meaning certain areas have for the region. Understanding how residents are attached to an area can be relevant to act appropriately (Walker et. al, 2011). Place attachment may affect people's interest to engage in the development of a place (Define-Wright, 2009). Depending on the circumstances, a geothermal project could be perceived as harming or as benefiting the attractiveness of a location and its recreational use. Possible worries, needs and hopes concerning the project must be identified and taken into account in communication and participation approaches.

Among the factors that relate to the location of a project is the distance of the potential area of the drilling site to the residences. For instance, in the geothermal project of Szeged residents lived close to the system and thus complained about annoyances, such as noise which led to measures that attempted to reduce the noise (CROWD THERMAL, D1.3). Considering the spatial proximity of the drilling site to the residents' homes can be a first step to think of possible solutions for annoyances for residents.

3.1.2 Community

Among the factors that are relevant in understanding the expectations and the engagement of actors in geothermal energy projects are factors related to the community of a region. A guideline for public participation by Dialog Schafft Zukunft (2016) lists the following three groups as the public: affected citizens, interested citizens and the broad public. To tailor communication and participation measures specifically to target groups these groups must be identified. For instance, the following questions can be answered: What are the socio-demographic characteristics of the community? What is the relation of residents that lived in the area for a long time and residents who are new to the area? What are the dominant political attitudes of the citizens? As mentioned in [chapter 5.2](#) of this report depending on the political attitude value conflicts can arise. To describe the initial situation it is suggested to assess which groups in the community might be affected by the project, such as specific user groups.

Researching who lives in the community is also essential because it is important to know the groups of people and the stakeholders that need to be represented in the engagement process of a geothermal energy project (Nanz, & Fritsche, 2012). The aspect of representation relates to the democratic function of public engagement mentioned in [chapter 2.3](#). Finding out which

groups and stakeholders need to be represented leads to the advantages of conducting a stakeholder analysis.

3.1.3 Stakeholder analysis

When assessing the community the stakeholders that are or could be involved in a geothermal project should be considered. Examples of the main relevant stakeholders are listed in a guideline for public participation by Dialog Schafft Zukunft (2012): the citizens, the project initiators, administration and politics, companies, associations, experts, and the media. Depending on the circumstances and the nature of the geothermal energy project additional stakeholders can be added to this selection. For instance, related to the Húsavík Community Greenhouse in Iceland which will be heated by geothermal energy there are stakeholders who are unique to this project, such as individuals and businesses that are interested to grow vegetables in the greenhouse and schools that can visit the greenhouse for educational purposes.

Other stakeholders that are specific to the context of the Húsavík Community Greenhouse is a brewery that uses the greenhouse laboratory to grow hops in a controlled manner and stakeholders who can use a multifunctional public space for purposes like catering, lectures and events (CROWD THERMAL, D1.3). On the other hand, the geothermal energy project by the EAI310 Cooperative in Spain distinguishes itself from other projects as it has the aim to provide heating and cooling to 220 apartments. In this project there is an overlap of roles with the members of the cooperative being the promoters, the investors and the inhabitants/ users of the geothermal energy CROWD THERMAL, D1.3). These examples illustrate that depending on the area and the use of geothermal energy in the project the related stakeholders can vary.

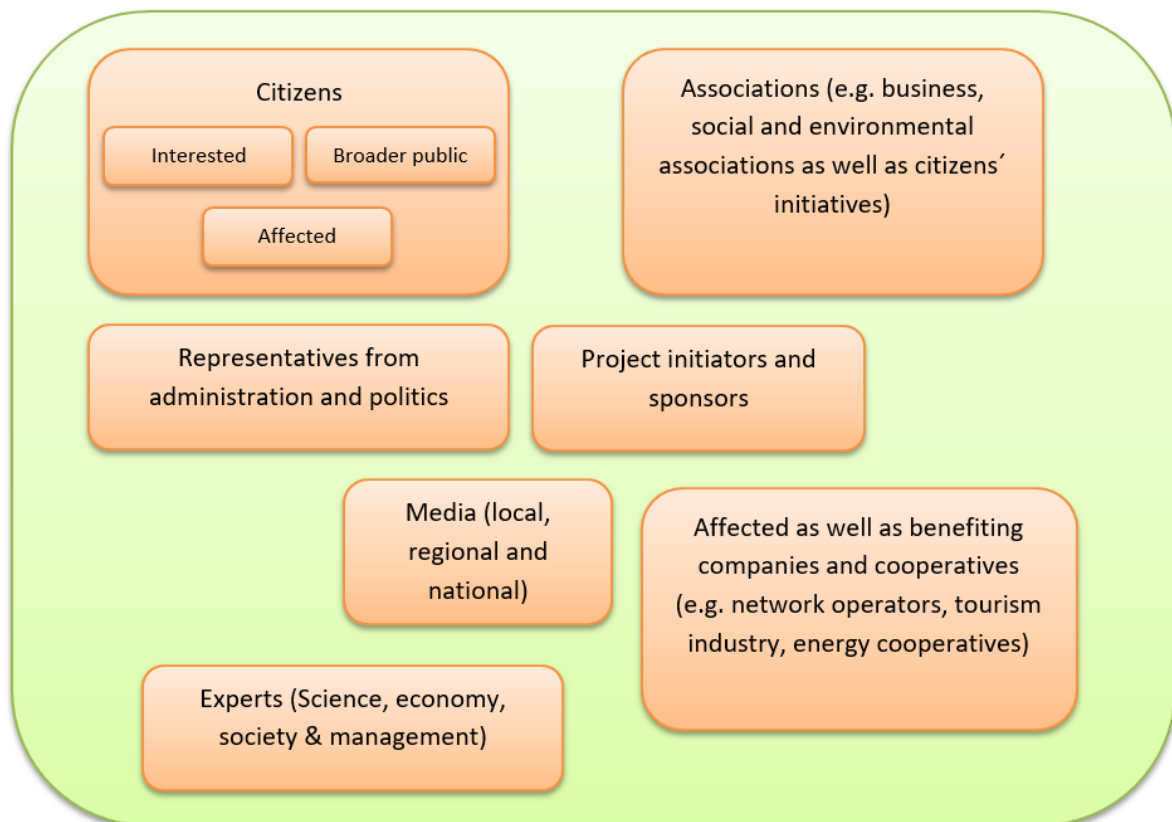


Figure 3: Stakeholders, inspired by figure 16 in 'Werkzeugkasten Dialog und Beteiligung, Ein Leitfaden zur Öffentlichkeitsbeteiligung' by Dialog Schafft Zukunft

A stakeholder map can be created by conducting internet research and recommendations by asking local stakeholders for recommendations. Identifying the relevant stakeholders and their relation to each other is essential when tailoring the different participation measures to the existing target groups. For instance, the general public differs in the extent of background knowledge in energy topics from existing representatives and associations and thus, should be addressed differently.

A relevant factor with regards to the community and the stakeholders is the extent to which there is trust between stakeholders. In the geothermal project of the EAI310 Cooperative in Spain for instance, there seemed to be a high level of trust towards the project initiators who were end users of the energy source themselves (CROWD THERMAL, D1.3). The amount of trust between the stakeholders determines the way of communication that is needed in a project. If there is trust towards the responsibilities of the project among the residents this must be considered in the way the public is approached with this topic.

Another relevant question with regard to the stakeholder is: Who could profit economically from participating in a geothermal energy project? An example for the importance of examining stakeholders who could benefit financially from a geothermal project is illustrated in the example of Húsavík Community Greenhouse in Iceland (CROWD THERMAL, D1.3). The project in Iceland could be seen as an opportunity to increase tourism. The financial context is essential when deciding for the possibility of economic participation. The relevance of this aspect also became evident in the geothermal project by the EAI310 Cooperative in Spain. Due to the Spanish financial crisis the project initiators were worried whether the public would be capable or willing to support them financially (CROWD THERMAL, D1.3). These kinds of preconditions should be kept in mind when designing participation strategies.

3.1.4 Historical Context

Next, the historical context of the place should be assessed. It can be researched whether there were any events in the history of the project area that could influence the residents' reactions towards new energy projects. For instance, energy projects in the past may have an impact on residents' perception and their reaction to new energy projects. An example of such events are negative experiences with previous energy projects that impacted the area, for instance in the form of earthquakes. These experiences might cause distrust towards new energy projects. In a project area that has been impacted by energy projects before a high degree of sensibility is important in designing participation strategies.

Furthermore, the residents' experience with public involvement also is part of the historical context of a place. It might be helpful to assess the topics that have moved the public in the past and the residents' perceptions of public engagement. Were there demonstrations in the past and if yes, what did people protest for or against? It could be assessed whether residents' have positive or negative experiences with public participation and whether they feel like they can influence important decisions in their area. The experiences with regard to public engagement can affect the residents' expectations for upcoming projects. In some communities residents are frequently participating in ongoing projects and are motivated to be involved, in others it might be necessary to convince people to participate (Nanz, & Fritsche, 2012).

3.1.5 Vision

In order to estimate the situation in the project region it is relevant whether there already is an existing vision in terms of energy solutions that is manifested, for instance in a resolution by

the local council to achieve a specific goal, e.g. climate neutrality connected to a specific date. Examples are 100%-renewable energy communities or zero-emission-municipalities (<http://www.100-res-communities.eu/>). If it is already the vision to invest into renewable energy and the residents democratically choose to take a more sustainable future the method of public engagement can be designed accordingly. Also on a national level, the energy strategy of a country is a vital contextual factor that defines the initial climate in which a geothermal energy project is planned. Examples for contextual factors on the national level are national energy strategies or climate protection policies.

The commitment to specific goals with regards to the energy situation of an area is also reflected in the existing legal conditions. Legislations about energy and building regulations can have a big impact on residents' energy needs. This was the case in the geothermal project of the EAI310 Cooperative in Spain in which requirements to use solar thermal systems for hot water were perceived as limiting by the project initiators in cases when people wanted to use another energy efficient system (CROWDTHERMAL, D1.3). Knowing these preconditions can be used to approach the public adequately.

3.1.6 Political Context

The political context is closely connected to the vision of the future. The sensible design of an engagement strategy requires the assessment of the local political situation. The support and position from interest groups towards environmental and energy topics are relevant for the participation process. The case of the geothermal project in Szeged illustrates well how the political context is an important component of the context analysis for engagement plans. After initial political controversies the project has the support of the city council and the city hall initiated a campaign in favour of the geothermal project (CROWDTHERMAL, D1.3).

3.1.7 Knowledge on Geothermal Energy

How engagement strategies with the public should be designed depends on the knowledge about geothermal energy among the relevant stakeholders. In the town of Húsavík, for instance, the level of knowledge about geothermal energy is relatively low but residents seem to be open minded to learn about it (CROWDTHERMAL, 1.3). Apart from the level of knowledge about different aspects of geothermal energy the context analysis could explore what kind of information residents and other stakeholders would perceive as useful. Another question is which informational sources the public perceives as trustworthy. These kinds of information gaps and opinions should be identified in order to be able to provide the information that is needed.

3.2 METHODS PREPARING PUBLIC ENGAGEMENT²

3.2.1 Stakeholder map

A stakeholder map is a tool which enables identifying different groups and institutions that play a role in the engagement process of a project. Results from studies using different research methods, such as literature research, media analysis, interviews and surveys, can be used to add information to the stakeholder map.

3.2.2 Media Analysis

In order to assess the project's context the following methods can be used. A media analysis is a useful tool to research which topics have moved a community in the past. This analysis can be used to assess the historical context of an area. Aspects that can be focused on in the media analysis are topics of discussion in the area and projects in which residents are engaged. Furthermore attitudes towards these topics can be assessed. For instance, the local newspaper could be used as a resource and representatives from the local and regional media could be contacted.

3.2.3 Surveys

Surveys can be a method to investigate residents' and other stakeholders' perceptions of certain topics, such as public involvement in the area in general, knowledge and attitudes towards geothermal energy and other energy sources, their trust towards the project initiators and other authorities and specifically about geothermal energy.

3.2.4 Interviews

In order to receive more elaborate responses qualitative research is valuable. Semi-structured interviews with different stakeholders can be a helpful technique to identify region specific themes and factors that need attention when planning strategies for public engagement in geothermal energy projects. In the interviews questions can address experiences with local projects and needs.

² For all methods used which include working with stakeholders the question of personal data might occur. Therefore, General Data Protection Regulation (GDPR) compliance rules should be reflected correspondingly.

3.2.5 Literature Research

When certain characteristics of the community have been identified in the assessment of the context in a project area literature research can be used to find out whether there is knowledge and recommendations related to these factors.

As a geothermal energy project progresses the context continually evolves, which means that there might be changes in the social, political or physical environment of the project. Therefore the context should not be viewed as consisting of steady factors. Instead contextual changes during the different phases should be taken into account in the course of the project. Additionally, the relationship between the context and renewable energy projects works in both ways: The context affects the course of the energy project and the project, in return, influences contextual factors. Thus, it is advisable to assess these factors at several points in time.

4 PROJECT PHASES AND FORMATS

The last part of the deliverable consists of an overview of different project phases from the social dimensions' point of view. It is supposed to illustrate what is happening when, or more general, how an appropriate order of different steps *could* look like. It is important to note that the following chapter is not supposed to be interpreted as a recipe that you can adopt in exactly that proposed way. There is no guarantee that implementing this exact guideline will surely lead to success. The introduced phases with the different measures for participation are also not claimed to be complete or to represent all measures possible. It is more a pool of ideas out of which suited actions can be picked for the implementation of a geothermal project. The saying "not one size fits all" puts the situation for the social dimension of public involvement in a nutshell. The specific needs for information and participation depend on the location. Every place has a different background and different preconditions, so an adjustment of the proposed measures to the individual circumstances of a project's future site is important (compare chapter [3, Context Analysis](#)).

The recommendation is to not focus too much on the specific instruments, but to have a wider view on the surrounding context: What do I need? What is the suggested instrument for the phase? Do I reach my goal with this instrument regarding the setting? Contextual factors that should be taken into account are listed and more specifically explained in chapter [3, Context Analysis](#).

The participation methods that are presented in the following are proved, but they can only make their impact when used in a suited situation. This leads to the circumstance that some measures work for one project, but not for another.

To sum it up, there is the need to evaluate the suggested participation measures regarding their fit with the needs that exist in a respective place.

Generally the process of project implementation can be divided into 6 phases: Project definition, Exploration, Drilling, Construction, Operation, Decommissioning and Post-Closure (compare Figure 3). The way the different instruments are distributed over the phases is only one of many possible orders. Most of them can shift between phases if it is opportune for the project course.

The way this chapter is structured is that every project phase is explained further in detail with different participation measures proposed. For every phase there is a brief summation of the 'most important steps', whereas these can principally also vary for an individual project and are therefore again not claimed to be appropriate in *every* case.

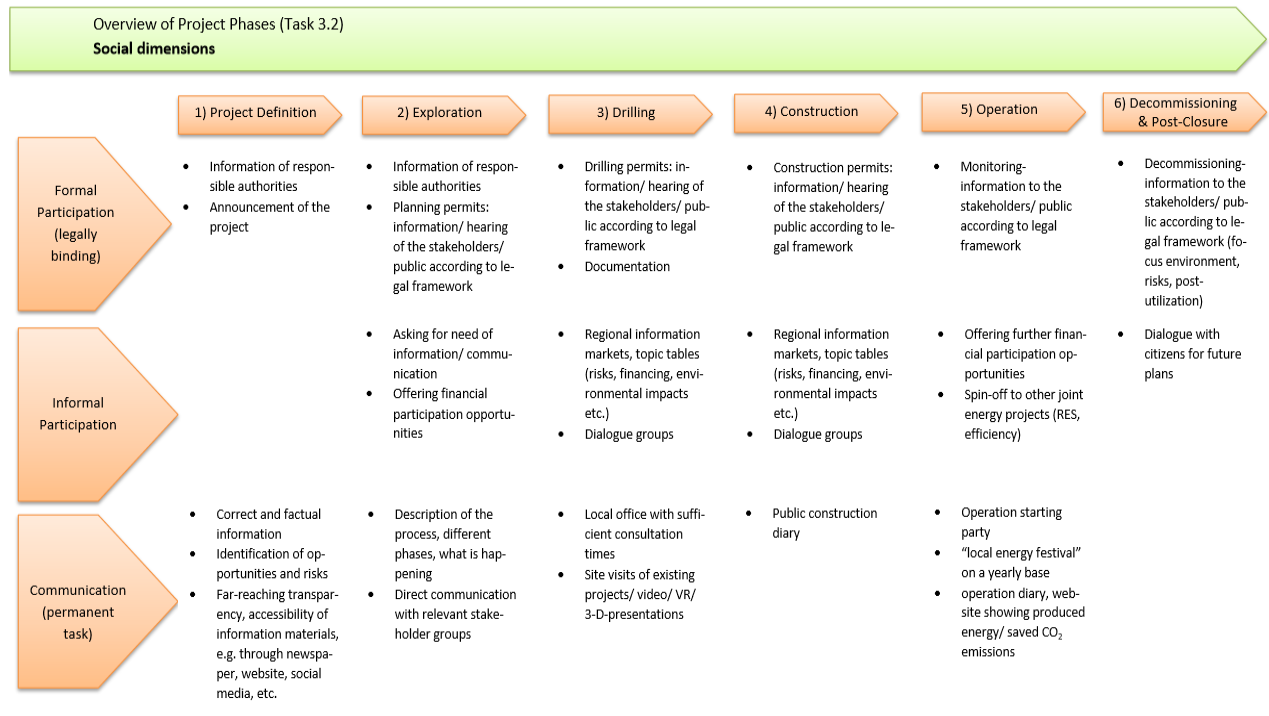


Figure 4: Overview of project phases for the social dimension

4.1 PROJECT DEFINITION

In the phase of the project definition, the above described aspects of [chapter 3 \(Context Analysis\)](#) play an important role, since the context analysis is a task that runs parallel with the phase of project definition. All existing information regarding the energy supply, the already existing supply networks and the subsurface are usually collated in order to ascertain whether the possibility of a geothermal system actually exists.

Getting familiar with the legal situation as well as getting in touch with the responsible authorities such as the respective agencies, the mayor, the district councillors and ministries or local press representatives can be considered as a main task. Depending on the dimension of the project, other authorities may need to be involved.

The announcement of the project can be useful not only for the authorities, but also for the citizens. In particular, it could be beneficial to give first thoughts to public relations. A first goal for public relations work in this phase could be to convey the visions for the project and the instruments with which these are intended to achieve to those people who are participants of the project. It should not be forgotten to also mention the possible consequences of the project. Communication is a task that occurs permanently in all project phases, but especially in the

definition phase, when it comes to shaping the project, the citizens should already receive information to have the possibility to think about the first plans, to develop an attitude and to make a contribution by giving their opinion which can be consulted and obtained by those directly involved in the project planning. Citizens should be given the opportunity to help shape the project in its very early stage.

It can be considered to look for professional support from the field of communication or mediation to reach a higher quality for public relations. The exchange with project managers from successfully established projects can also be helpful for structuring the own public participation.

What can also be important for the communication work in this phase is to make sure the provided information about the project is correct and factual. Access to information materials should by no means be laborious, but as easy as possible. Among other things, it is helpful to ensure diverse communication channels in order to reach as many citizens as possible since they all prioritize different channels. Possible examples of channels would be newspapers, websites or social media.

On the one hand, they should be informed about the benefits of the system, what advantages and opportunities it can bring so that it at best does not only convince those with no scepticism, on the other hand however, as already noted, the risks should not stay unmentioned. If one mentions risks, it is always advisable to also provide information about the technical side of the system so that the procedure becomes more understandable and the recipient can come to a subjectively more elaborate risk assessment (compare chapter [5, communication regarding risk and conflict prevention](#)).

In addition to guaranteeing information, far-reaching transparency is also important for successful public participation, which is among other things achieved through a high degree of information dissemination, handling things that concern the project openly and the possibility to get into discussion.

What should also be considered in this phase is active citizen participation, for example through participation of the municipality in the project itself or through a connection to local heating networks so that citizens can be joint users of the energy generated.

Project Definition – Top 3 Tasks

1. Analyzing the context
2. Informing relevant authorities, stakeholders and public

Figure 5: Relevant steps in the Definition Phase

4.2 EXPLORATION

Especially in the initial phases where a lot of planning and a lot of talking with different people is required to initiate the project, it is important to let the responsible authorities know about the individual steps and to keep them informed about updates or changes of the plans, but also about the exploration. In addition, it should be taken care of planning permits in this phase. Based on the respective legal framework that count for the area where the project is supposed to be sited, the public and stakeholders should be informed, and they should have the possibility to express their opinion and to get into discussion if this desire exists. That means also at this stage of the project it is important to provide information transparently, promptly and regularly.

It is advisable to carry out a structured and planned public participation in order to have a concept of when to communicate what to which interest groups and how to communicate it. The citizens should be informed of the exact plans, which phases are imminent and what exactly will be done in which phases. In case information events are chosen as a measure, it can be considered whether experts such as representatives of the authorities or experts from science are available to answer questions.

If the project planning, additional to the intellectual participation of the public, contains thoughts to offer financial participation, this phase offers the chance to introduce the possibilities for it in this project.

In addition, when communicating with the public, there should also be emphasized that all operations related to the project are properly carried out and must first be checked and

approved by the responsible authorities and that the developer is responsible and liable in case of malfunctions or other incidents. This helps creating the certainty that the mentioned risks are minimized by a respectable amount of safety precautions by authorities that are independent from the project. Furthermore, the fact that the project managers have a personal interest in carefully planning and carrying out all processes due to their liability is reassuring.

Personal closeness is crucial for acceptance and creating trust. What has therefore proven to be beneficial for many renewable energy projects was that the population had a direct and reliable contact person to whom they could turn to with all their questions and concerns. This chosen person should be able to provide answers to the various questions about different aspects of the project. A permanent presence of the contact person, for example through a local office, is ideal. This makes contacting easier and guarantees the feeling that there is always the option to turn towards the responsible with burning, but also with less burning questions. In addition, this local presence confirms the feeling of being taken seriously and being involved instead of being left out of the project. Next to a local office, there is also the possibility to offer digital presence. An internet platform like the official website for the project could offer an area where questions can be stated and collectively answered by the contact person via FAQ-videos on the website or on social media. A measure like that primarily addresses the younger target audience, but it surely is a good addition to signalize presence. It is also advisable for the representative or a specially appointed press representative to speak to journalists, but also directly to citizens about the progress of the project in regular intervals. This also creates a feeling of personal closeness and trust on another level.

In order to ensure a regular exchange with relevant sector agencies, nature conservation associations or environmental protection associations, it is advisable to set up a project advisory board that meets at regular intervals to exchange information on the latest developments.

In general - and this applies not only to this phase, but to all phases of the project implementation - there should always be a reflection loop. Measures that have worked well up to the present time of rechecking, can be continued, measures that need to be improved should be revised for the following phases. But after all, since a municipality or a region is a living system, the first context analysis that is conducted is only a snapshot. Things like the social system or the political framework can change during the process of project implementation since it can take up to several years. Thus, it is also important to consider whether the actor constellation of the initial phase is still the same, how the dynamics are at the current

moment, how the media is currently reporting and so on to then decide which participation measures fit best for the following phase.

Exploration – Top 3 Tasks

1. Planning permits & required information/hearing of stakeholders and public according to legal framework
2. Offering financial participation opportunities
3. Direct communication
 - with relevant stakeholder groups (e.g. project advisory board)
 - with the citizens → personal closeness

Figure 6: Relevant steps in the Exploration Phase

4.3 DRILLING

The basic requirement for this phase is to have the permit to drill. Here, just like in the phases before, it is important to inform existing stakeholders and the public about the phase and its potential side-effects, guided by the legal framework. In addition, the work should be documented regularly.

The works that are carried out during this phase shift the focus of the communication work on topics such as noise, steam or odour annoyance as well as increased traffic caused by trucks because building materials need to be transported.

These inconveniences can only be minimized to a limited extent. For example, truck deliveries could be set at certain times so that residents are not bothered all day, or protective walls could be erected around the drilling site so that visual impairment is reduced to a minimum and noise and steam nuisance reduce as well. On the part of communication, an early and comprehensive provision of information about the measures that are to be expected can be recommended, especially to those directly affected by the works. Addressing possible

problems can be beneficial in order to find a compromise or even a solution for the respective difficulty. For example, during the drilling phase, a news ticker could be installed on the project website. Citizens could inform themselves about noise peaks, for example, or see how long the drilling phase is planned to last. This information can possibly contribute to making the construction noise more bearable because information is provided and "an end is always in sight".

Beyond the mentioned measures, seismic campaigns and other issues of concern should become more important for public relations during this phase. Any remaining fears should be appeased or invalidated as much as possible. Confidence in the safety of the facility can also be achieved through local seismic monitoring networks that are installed to report any unwanted activities. The support of scientific personnel in monitoring and assessment is also an important component for generating trust. In addition, discussion groups can be offered to exchange ideas, concerns and opinions, or topical tables can be offered that for instance deal with risks, financing or the effects of the geothermal system on the environment.

It is also recommended to continue using the information material and information options from the previous phases, including the direct contact person for questions or comments. Things like short films, handing out flyers with images and explanations, and information events with lectures have also proven their worth. One possibility to make the information events more personal is to offer regional information markets with many subordinated small information events without large stages or lecterns and a smaller number of recipients. This could reduce the risk of hardened fronts, the recipients would have more of a chance to ask questions and make comments, and those present are closer to each other personally which makes it easier to start a conversation, which has the potential to make the events more productive overall. However, it is important to note that the personnel costs are significantly higher than for traditional information events.

When dealing openly with the project and entering into discussion with citizens, it can be expected that they have found negative examples of geothermal projects in their own research and put them up for discussion. It therefore makes sense to be prepared for this confrontation and to present negative examples by oneself that did not go as planned, but also positive examples that balance the negative ones. If it offers itself, the causes of the problems can be addressed in the case of the negative examples and the precautions taken for this particular project to avoid the same problems can be presented.

There are also other ways to involve the public in this phase. In consultation with representatives of the commune, events such as open door days or guided tours over the drilling sites can be planned that bring the technology closer and make it more tangible and imaginable because it can be seen with the own eyes. If a live tour is not possible for various reasons, there is still the option of filming a tour and presenting it, as well as offering virtual reality or 3D presentations of the drilling sites.

If there is a breakdown or damage during the phase, it should be dealt with transparently and openly. Information about the occurrence should be given as quickly as possible, questions and conflicts should be dealt with prudently and comprehensively. This stresses the importance of risk communication strategies that should be prepared in advance to be able to react quickly and organized in case of an emergency. Of course, trust in the system can decrease as a result of an incident, but being honest leads to much better chances that the incident will not have a permanent negative impact than if there is an attempt to cover it up. In the last case, the breach of trust would be aggregated to the reduction of trust in the technology.

Drilling – Top 3 Tasks

1. Drilling permits & required information/hearing of stakeholders and public according to legal framework
2. Dialogue
 - with directly affected citizen
 - addressing fears → seismic campaigns
 - organizing regional information markets/ topic tables
3. Enhancing the familiarity with the project
 - offering tours over the site
 - organizing presentations

Figure 7: Relevant steps in the Drilling Phase

4.4 CONSTRUCTION

For the construction phase, the construction permits are the requirement to start into the phase. The same participation measures as for the drilling phase can be applied, in this case focusing

the construction works. Again, a critical reflection of the measures used until then is recommendable and in case some were not successful in the drilling phase before, they should either be improved or they should be refused for this phase.

A suitable way to keep the public up to date with the progress in construction works is writing a public construction diary, which can be realized in the form of blog posts on the project's website. Adding pictures can enhance the information content.

Also, topic tables or discussion groups can still be a part of the participation work of this phase if applicable respectively if there is a need for it.

Generally, proving flexibility by assuring that the measures for participation comply with the needs of the public or those of other relevant stakeholders can be advised for this phase. Among other things, it is useful that the reliable contact person for the project is still available for contact, also as a measure to express presence.

Construction – Top 3 Tasks

1. Construction permits & required information/hearing of stakeholders and public according to legal framework
2. Public construction diary
3. Dialogue
 - organizing regional information markets/ topic tables
 - maintaining the reliable contact person

Figure 8: Relevant steps in the Construction Phase

4.5 OPERATION

After the construction phase has been completed, the commissioning of the system is on the agenda, the kick-off for energy production. For this phase there are still some measures that can be applied in terms of participation.

For example, it can be considered to write an operation diary, which can be shared via the projects' website or a digital display, providing information on the energy production, for example how many kilowatt hours or megawatt hours of energy were produced per day in order to provide an impression of the performance of the system.

In the case of renewable energies, it is also advisable to report the CO₂ savings or savings in other environmental pollutants, or how much trade tax has been paid to the area. Primarily it is no longer about ensuring acceptance or avoiding conflicts, but about the perceived added value of the project after commissioning, which can be achieved by receiving corresponding information. Thus transparency is not only an important aspect for the project implementation but furthermore for creating awareness of the benefit based on the verifiable effects the system offers.

It is also important to note that in this phase of operation, it is still the entire system the geothermal plant is embedded in, that needs to be considered; meaning not only the operator, but also the social system is of concern. It is therefore advisable to provide the possibility to contact someone with concerns addressing the project, either by maintaining the contact person of the local office or by setting the operation manager as a new contact person after the construction works have ended. Independent from who that person is, it is important that there is a central, continuous and immediately reacting contact that is always available if there are any disruptions or other complaints.

In addition, it is always a good idea to look out for additional opportunities for participation, such as thinking about whether to open the project to others or whether to divert heat, in order to supply the community and make them a joint user. But this can also include other financial participation opportunities that have not been offered before.

Now that the facility has been implemented, another question of relevance is how to not only derive economic benefits from it, but also benefits belonging to the other two dimensions of sustainability, namely the ecological and social dimension. For example, how could this project be used to promote and support other climate protection projects in the region? Could spin-offs to other joint energy projects be realized? The influence is not necessarily limited to projects that include renewable energies, the project could rather serve for advances in broader sustainability purposes, like the case study in Husavik, Iceland, which plans to include the educational sector into their project in forms of class trips or lessons on site.

All of the above mentioned measures for participation in the operation phase indicate the fact that the participation work and communication work does not end with the completion of the systems' construction. Even if the system has been running for years, as a project manager there is still a responsibility on site, they are still anchored locally and in the social system and should therefore continue to shape the process and to continue being available. The idea

should not be to turn ones back on the project after successful commissioning in order to devote to the next project.

Operation – Top 3 Tasks

1. Providing monitoring information according to legal framework
2. Operation diary
 - information about produced energy
 - information about saved environmental pollutants
 - Perception of the added value
3. Stay present

Figure 9: Relevant steps in the Operation Phase

4.6 DECOMMISSIONING & POST-CLOSURE

There comes the time when the demolition of a geothermal system impends. The recommendation for this phase of decommissioning and post-closure is to concern with the topic early enough. It is important to be informed about what the legal framework regarding the demolition of energy plants looks like, what needs to be done, for example what kind of data and plans need be provided for this undertaking. But also for this phase, there are some participation measures that can be taken into account.

First, it can be advised to be transparent about what is going to happen with the plant, why it needs to be done, how it is planned to be done. All of these issues can be broached in the form of citizen dialogues. Furthermore there is the possibility to concretely ask the citizen what could be the next step for the area, what kind of future projects come to their minds or what their needs and visions for the community are. By integrating the ideas of citizens for future plans, but also more general by striving for a good relationship with them during the entire period of the geothermal projects' implementation and operation, there is a good chance to soon be able to plan a new project for the area after the demolition of the previous one.

Decommissioning & Post closure – Top 3 Tasks

1. Inquiring about and implementing the necessary steps according to the legal framework
2. Early and transparent information about the decommissioning
 - to stakeholders
 - to citizens

Figure 10: Relevant steps in the Decommissioning & Post closure Phase

5 COMMUNICATION REGARDING RISK AND CONFLICT PREVENTION

5.1 THE IMPORTANCE OF ADEQUATE (RISK) COMMUNICATION FOR GEOTHERMAL PROJECTS

Geothermal infrastructure planning projects are complex environmental-technical projects, mostly embedded in a just as complex socio-ecological context. Uncertainties and risks can be found at various levels (planning stages, environmental, economic, social level etc.) and through the different project phases. Geothermal projects are therefore highly complex situations that should be taken into account with appropriate and socially-acceptable communication.

From previous experience with geothermal projects, users can learn a lot so that possible conflicts can be countered preventively. Especially regarding risk communication there should be two different strategies: a) adequate communication of the risks within the framework of public participation in planning and implementation of the project and b) a communication strategy when a possible risk scenario actually occurs.

In the following, the opportunities and potentials of proactive risk and conflict communication are highlighted, especially in the participatory process of planning and implementation of geothermal projects. Risk and conflict avoidance communication with a preventive focus cannot be clearly distinguished from one another, rather there is an interlinking between the two.

5.2 COMMON CONFLICT TOPICS

There are several of thematic triggers and causes of conflicts that can occur in the context of geothermal energy projects (see also CROWD THERMAL D1.1). These triggers could appear in all phases of the project, however, they are most likely to occur in the first four phases and in the operational phase during incidents.

In the following, four main points of conflict and approaches that contribute to their resolution are shown.

Unequal distribution of advantages and disadvantages/conflict of distribution

The advantages and disadvantages of a geothermal system are often unequally distributed: Companies earn money with the system, residents fear the loss of value of their properties, induced seismic events or the release of pollutants and noise from the system. Often, the population fears material and immaterial disadvantages without seeing any direct advantages of the geothermal plant. As the choice of words already suggests, on the one hand, on a rational level there are actually detectable inequalities in distribution. On the other hand, many processes take place on an emotional-cognitive level (e.g. fears, anxieties, perceptions). These processes are deeply depending on the individuals and no certain rule can be applied here to take away the fears. These emotional processes can rarely be successfully countered with pure reasoning alone - this should be kept in mind for any further project-related communication.

Different preferences and values

Based on the planning process of the plant, values of the citizens concerned emerge, which may not have played such a major role before. What does climate protection mean to me? Depending on the political values orientation, perhaps also: Do I believe that as a human being I must do something about (human-made) climate change? (Particularly among supporters of the conservative to right-wing spectrum, the fact of human-made climate change is often denied, therefore the ecological need for renewable energy infrastructure may be seen critical). What is the value of protecting the landscape in which I live? How many compromises am I willing to make for the security of a reliable energy supply with renewable energies?

Here, conflicts of values can first occur at an individual level and further emerge at a societal level: Renewable energy production vs. protection of the landscape (NIMBY problem), security vs. economic efficiency, etc.

Social and/or political conflicts

In some cases, already existing social conflicts can also fuel a possible dispute over the construction of a geothermal plant. Equally important are the political conditions directly surrounding the project construction and beyond at the local level: Are local elections perhaps imminent and may the project or a dispute over the project be used politically?

Different interpretations of the level of knowledge

The knowledge conflict is about different professional assessments:

From the point of view of those affected, questions about geothermal energy that are personally considered important are not sufficiently scientifically answered, for example the question: Is health sufficiently protected even when the emission limits are observed?

The following table relates the most frequent conflict types described to the four levels of the participation pyramid. Here, exemplary formats and approaches are mentioned that can be used to avoid or resolve conflicts depending on the respective level of participation. For a more detailed explanation of the formats, see Roewe and Frewer (2008) and Nanz & Fritsche (2012) (German).

	Conflict of distribution	Conflict of values	Socio-political conflicts	Conflict of knowledge
Information	Press information, internet and social media, flyers, summaries, <u>visualisations</u> , inspections and excursions (content respectively tailored to conflict issues)			
Consultation	Early round of discussions with affected persons Event on the follow-up of projects: Citizens ask, experts answer	early workshop with critics Public event with Speakers Corner	scenario workshop e.g. in a school project or in a local club	Expert-hearing
Cooperation	<u>Planning workshop</u> <u>Round table</u>	Values are hardly negotiable in the short term, so it is difficult to recommend appropriate procedures. If enough financial, human and emotional resources are available in the long term, processes can be initiated that can contribute to attitude change. e.g. long-term workshops	Citizens' Jury	Technical Workshop Expert opinions
Agreement on scope of action	<u>Classical mediation</u>		Addressing the actual (hidden) conflict	Data mediation

Table 1: Conflict, level of participation and approaches (based on Ziekow, Barth, Schütte, & Ewen, 2014; translated and slightly adapted)

At this point, the importance of informal participation and preventive communication which goes beyond the legally prescribed formal participation, should be emphasised. Many potential conflict issues (e.g. loss of value of real estate, regulation of damage that cannot be clearly causally attributed, health issues beyond legal limits) are not part of the formal participation, although these are sensitive, emotional issues that play a major role for many participants in terms of acceptance of the planning process. It is important to hear and understand both sides

of the same coin: factual concerns go hand in hand with feelings and psychological conditions regarding geothermal projects (compare Chapter [5.4: Communication model](#))

5.3 COMMUNICATION OF ENVIRONMENTAL AND OTHER RISK FACTORS

The environmental (risk) factors of geothermal projects are influenced by many variables: What are the planned exploitation technologies (see also D1.2 and D3.2, especially figure 2: Technical geothermal project development phases, associated risks, costs and most appropriate alternative finance methods), e.g:

- Deep or shallow geothermal systems?
- What should be the use of the geothermal power generation: Electricity generation, direct thermal use or heat use via geothermal heat pump?
- If deep geothermal technology is used: At what depth is the borehole located?
- What are the geological conditions of the reservoir?

In addition to the purely environmental risk factors, there are numerous other factors at the social or psychological level that should potentially also be taken into account, to strive for an holistic overview of risks possible. For example, the perceived risk for induced seismic events probably does not match the scientific calculations for the probability of occurrence. Nevertheless, these individual perceived concerns should not simply be brushed aside. If the perceived risks are not taken seriously, there is a much greater risk of loss of confidence in the project managers. In the end, this could endanger the implementation of the project much more than the predicted probability of induced seismicity alone could. Here, too, we see the close links and partial discrepancy between technical aspects and the perceived reality of the people concerned. People do not just govern rationally and on an empirical basis, but due to subjective heuristics.

More detailed examinations of the impact of the environmental factors are provided in CROWD THERMAL D1.2 "Synthesis of environmental factors", the IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation (2011) or Kagel, Bates, & Gawell (2005).

5.4 HOW TO COMMUNICATE

“There are no easy prescriptions for effective risk communication. There are no magic bullets, no “cookbook” approaches.” Covello, Sandmann & Slovic (1988)

However there are certain baselines for “good” communication in general that also fit for good preventive risk and conflict communication

5.4.1 General Rules of communication

Preventive conflict communication aims to pacify the situation, create understanding and at the same time improve plant design where possible. This may seem like a tightrope walk, but is based on a few basic principles:

Communicative success is closely related to the credibility of the communicator. People - even without specialist background knowledge - notice very clearly whether one is open to their concerns and worries or whether they are actually just in the way while experts want to work out the good solution:

- Plan and evaluate the communication
- Accept and involve the public as partner at eye level
- Listen carefully
- Be honest, frank and open - be aware that trust and credibility are your most precious assets
- Work with other credible communicators
- Work with the media - do not underestimate the power of the local press
- Express yourself clearly and be empathetic
- Reflect your role in the communication process - check changing frame conditions

Communicate authentically and at eye level with those affected. Accept the people and their concerns - at first unconditionally and in the later course of the dialogue or participation it can be decided whether the concerns should be met.

5.4.2 Four Sides of Communication

As often mentioned before, there are different levels of communication: what an expert communicates may reach the people concerned in a completely different way than what was meant, and vice versa, an expert may not hear hidden concerns in the enquiries of the people concerned.

At this point we would like to introduce the Four Sides Model of Communication by Schulz von Thun as an illustration of the different levels of communication.

Developed in 1981 by the German communication scientist Friedemann Schulz von Thun, the model can systematically capture and clearly explain misunderstandings in communication. Up to now the model is broadly used and it would fit well in the socio-technical communication claims regarding geothermal energy projects.

The basic idea of the model is that messages can be communicated from different mouths and heard by different ears. Thus, the same statements can be understood in different ways and the same information elicits different reactions.

The four sides of the model include the factual level, the self-revelation, the relational side and the appeal.

The factual level contains facts, content and information. The challenge for the sender here is to express the facts in a clear and understandable way. On the self-revelation level, every utterance reveals more or less consciously information about the personality or the current inner state of the sender. The relationship level deals with the emotions regarding the grasp and understanding of the information and is influenced by how the sender relates to the receiver and what the sender thinks of the receiver. Relationship cues are conveyed in direct communication through wording, tone of voice, facial expressions and gestures. The appeal expresses what the sender wants the receiver to do. There is an attempt to influence the receiver: wishes, advice or instructions for action are sent openly or covertly.

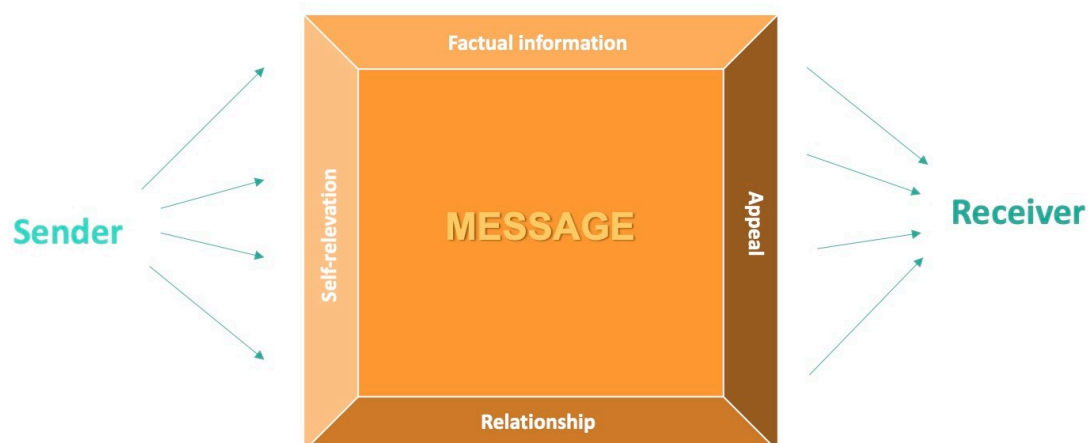


Figure 11: Square model of communication (based on Schulz von Thun, 1981)

All these levels are sometimes more, often less clear from the communicated message. Especially for the side leading the participation process, this model can be useful to understand why some messages are received differently by the public than initially expected. Insights from the model can be used to better adapt content and also the implementation of communication to the different levels of understanding on the part of the recipient (the participants).

This model also supports the crucial role of the relationship between sender and receiver, in the field mostly embossed by the trustworthiness of the project manager side. More importantly: It shows that purely factual information represents only a quarter of the total “communication pie”. This is essential for all communication action coming from experts from a technical and rather rationally shaped background.

6 CONCLUSION

Participation is a must for the realization of renewable energy projects. It is regulated through legal frameworks for the case of formal participation, but beyond that there are also important informal participation and communication measures that have proved to be crucial for the success of a project all along the line.

[Chapter 2](#) provides an extensive overview of the definition and actual meaning of participation. The “pyramid of participation” is a good visualization of the important sub-process and helps to understand the tasks and responsibilities of the participation-involving side and as well as on the side of the participants. The various arguments for why participation is important can be used to convince doubters of the value of participation and to consolidate own positions.

[Chapter 3](#) points out that it is essential to consider the existing (contextual) preconditions of a project when deciding on public engagement strategies. Aspects that should be assessed are factors concerning the place where a project is supposed to take place, its community, the relevant stakeholders, the historical context of the area or region, the existing vision in terms of energy solutions, the political context, and the existing knowledge on geothermal energy. These aspects can be assessed by conducting a media analysis, surveys, interviews and literature research.

The presented project phases in [chapter 4](#) are supposed to give an impression of what could be done during what time period of the project. The different instruments illustrated do not belong to a certain phase and are therefore flexibly applicable in suitable situations during the implementation respectively operation process of an individual geothermal project. Individual is an important keyword for repeating that the selection of certain participation measures is no

legitimacy but rather a decision that can vary strongly between different projects, since no contextual situation is the same.

To sum all the suggestions up, an overall recommendation could be:

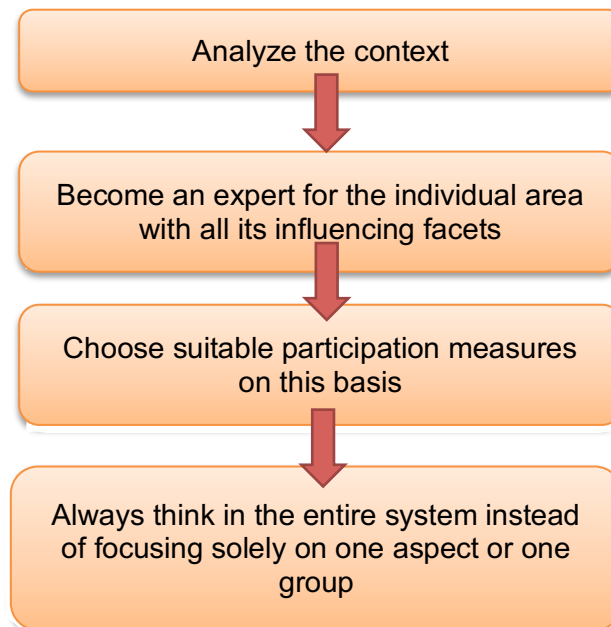


Figure 12: Overview of relevant steps for planning and implementing public engagement

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