



CROWDTHERMAL DELIVERABLE 4.3

SYNERGY BETWEEN ALTERNATIVE FINANCE AND RISK MITIGATION

<i>Summary:</i>
A conceptual framework to gather the information needed to select appropriate alternative finance and risk mitigation instruments that suit a specific geothermal project and its target community.

<i>Authors:</i>
Georgie Friederichs, Crowdfunding hub, senior consultant



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Reviewer	Christina Baisch, GeoT	Project Manager	03.08.2021	
Reviewer	Jan Hildebrand, IZES gGmbH			
Project Coordinator	Isabel Fernandez	Project coordinator	25/08/2021	

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ABBREVIATION TABLE

CSR: corporate social responsibility
EFG: European Federation of Geologists
LTP: Linked Third Parties
SLO: Social License to Operate

1. EXECUTIVE SUMMARY

This report describes a conceptual framework to help find combinations of alternative finance instruments and risk mitigation instruments that match a project developer's objectives, and the characteristics of the target community, in a geothermal project.

Using the alternative finance and risk mitigation instruments described in work packages 2 and 3, five steps have been defined to help a project developer determine why he wants to involve the community, what results he is hoping to achieve, what risk levels fit these goal, and what finance and risk mitigation instruments can be used to achieve this.

When using the framework to search for the most suitable instruments social science and financial science should be combined, as the social license to operate (SLO), public engagement, and social acceptance are influenced by the finance and risk instruments chosen and vice versa.

The framework consists of the following steps:

- Step 1. Define the involvement goals
- Step 2. Define and select your community
- Step 3. Define the community (risk) profile
- Step 4. Define the appropriate risk level for the financial instrument
- Step 5. Define the finance and risk mitigation options

After all the steps have been followed and the relevant information has been gathered possible alternative finance and risk mitigation combinations can be selected.

The conclusions and recommendations of the report can be found at the end. In short they are the following;

Conclusions

1. A lot of different factors are involved when choosing the right alternative finance and risk mitigation instruments.
2. The research should follow the steps mentioned above for optimal results.
3. A case-to-case approach is important as lots of different combinations of the individual factors are possible.
4. The risk of certain instruments is usually inversely related for the project owner and community investors.
5. The risk absorbing capacity and risk appetite for both project developer and community are very important when choosing the best combinations of alternative finance and risk mitigation.
6. The wishes of the community are also very important.
7. Not all combinations of risk mitigation instruments and alternative finance instruments result in the desired decrease of risk for community investors
8. Risk mitigation can change the possible use of alternative finance instruments and increase the possibility of realizing the wishes of both community and project developer.

Recomendations

1. Do not copy past successful alternative finance and risk mitigation combinations from other projects without research.
2. Beware every action has an effect on your target community, even a survey starts involvement.
3. Even if community involvement is not high on the agenda, informing the community will always benefit the project.
4. Risk mitigation can be a very powerful tool to facilitate community involvement and support in geothermal projects. The European Union and member states should research the possibilities of developing more risk mitigation solutions for geothermal projects .
5. The risk mitigation mechanism developed in CROWD THERMAL work package 3 should be investigated as a European level.

Other parts of deliverable 4.3 have been the testing of alternative finance instruments in case studies, which is an ongoing process, and the monitoring of threats and opportunities for the results of, and tools developed by, the crowdthermal project.

Annex 1. Gives an overview of how a plan for the social engagement in a project can be started and which ingredients are needed. Annex 2 shows which case studies have been followed and a short status this process is in. Annex 3 contains the results of the workshop that was held in June 2021, in which the threats and opportunities, and possible solutions for the results and tools of the crowdthermal project were analyzed.

2. OBJECTIVES AND APPROACH OF WP 4.3.

The task description of workpackage 4.3 has been adapted during the project. This was necessary because during the realization of the project some overlap, and time schedule mismatches, became clear. The new task description is as follows:

This task will develop a framework of possible combinations of alternative finance methods and risk mitigation instruments as found in WP2 and WP3. It will design specific combinations of new and existing fintech methods with risk mitigation methods that covers both geothermal and financial risks.

By using input from LTP's¹ and altfinator hubs, potential geothermal projects can be identified which can be advised on the implementation of the designed combinations. The new models will be tested and implemented in close collaboration with existing crowdfunding platforms in the countries covered by the EFG Third Party Network and the Altfinator Hubs. The task will use successful projects also as best-practice (described in CROWD THERMAL deliverable 2.1) case study (described in CROWD THERMAL deliverable 2.2) to explain the concept (and opportunities for the public) to a wider, international audience.

In addition, this task will further investigate social cooperation schemes between the groups of actors, also reacting to emerging issues as they may be identified during the implementation of WP1-3. The goal will be a better adaptation of CROWD THERMAL strategic goals to previously unforeseen opportunities (and threats) in the context of geothermal dialogue between the groups of actors involved in financing and development. In particular, it will be important to develop means for building trust by involving the public in a very early stage of the project and building momentum and a story around the new projects.

By analysing this description, we have divided the task into three separate parts:

1. The synergy of finance and risk mitigation instruments
2. The testing of financial instruments in case studies
3. The monitoring of threats and opportunities

Part 1. "The synergy of alternative finance and risk mitigation instruments", will be the subject of this report. In the report we will develop a conceptual framework for the choosing of alternative finance and risk mitigation instruments that fit a project's goals and its community. This will include the determination of the goals of the project developer for involving the community, and the selecting of the target community for the alternative finance and risk mitigation instruments. These are crucial first steps for selecting the right instruments.

Part 2. and 3. are more practical tasks.

Part 2. The testing of financial instruments in case studies, is an ongoing process which depends on the time frame of the case studies. In Annex 2 in this report, we will give an overview of the first 4 months of testing.

¹ Within the CROWD THERMAL project, EFG involves its National Associations as Linked Third Parties to support the project's data collection and dissemination efforts.

Part 3. Is the monitoring of threats and opportunities, and possible solutions or requirements, that are not being addressed elsewhere in the project. Annex 3 contains a summary of the workshop that was held in June 2021, in which the threats and opportunities, and possible solutions were analyzed.

3. THE BUILDING BLOCKS OF A FRAMEWORK.

3.1 INTRODUCTION AND SOURCES

This report will describe a conceptual framework for the selection of alternative finance and risk mitigation instruments in geothermal energy projects. In geothermal projects both alternative finance and risk mitigation instruments can be used to increase the success of the project, and to increase the involvement of, and benefits for, community members.

In the CROWD THERMAL project a lot of work has already been done on researching possible alternative and innovative finance methods and possible risk mitigation methods.

Work package 2 contains a report showing 10 best practices where alternative finance was used in sustainable energy project and a report describing possible alternative finance methods and some supporting instruments and methods for geothermal project. Work package 3 contains an inventory of possible risks related to the use of alternative finance in geothermal project development. An inventory was also made of the risk mitigation tools to alleviate these risks. Finally, the conceptual framework of a new risk mitigation scheme for geothermal projects that apply community funding has been developed in work package 3.

The information from work packages 2 and 3 mentioned above give us insight into different possibilities and examples of alternative finance and risk mitigation.

Other sources of information used to develop the framework are the workshop on threats and opportunities held with the CROWD THERMAL consortium, and the first testing with case studies.²

The information from these sources is the starting point for the conceptual framework.

3.2 GOAL AND DEFINITIONS

The goal of the framework is to assist project developers in defining possible combinations of alternative finance methods and specific risk mitigation instruments that optimally match the aims and objectives of the project developer and give the desired benefits to the members of the target community.

² See Annex 2 and 3 of this report

The framework focusses on the steps that should be made when selecting the possible combinations of alternative finance and risk instruments for a certain project. To be able to make these steps the following points must be taken into account:

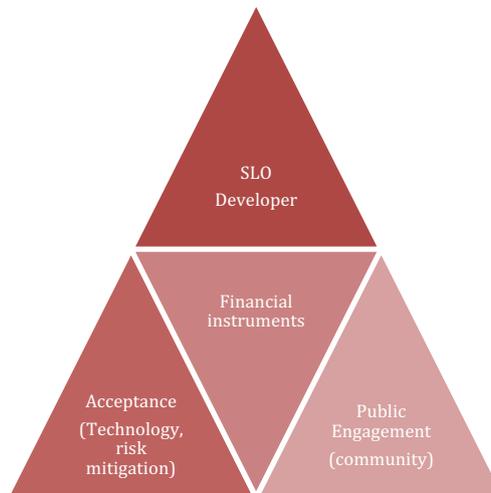
1. The definition of risk. The conceptual framework focuses on the financial effects of risks for both community investors and project developer. The underlying actual risks can be caused by either the use of a certain financial instrument or the operational risk (resource risk) of the underlying project itself.
2. The framework is written for a project developer who wants to involve a community in his geothermal project. In some case the community is the project developer. This can change the relevance of certain steps in the framework.
3. The framework aims to help the project developer to define his goals and conditions so that the right possibilities and combinations can be selected.
4. The community defined through this framework is the target community for involvement through alternative finance and risk mitigation instruments. This definition (or the boundaries of the defined group) can differ from the relevant community for the project in a broader sense. For example, not the whole community that is potentially affected by the project will be interested in or motivated by financial participation.
5. Without knowing the specific circumstances (conditions) of a certain project and its developer and the target community, it is not possible to advise on a certain alternative finance and risk mitigation instrument combination. All the variables together decide which is the optimal choice to make in a certain project. The framework helps to define the variables so an informed choice can be made.

3.3 Social research meets financial instruments

Before we present the conceptual framework and its steps it is good to determine where the framework and its decisions are placed. The decisions made when going through the framework and selecting the possible financial and risk mitigation instruments require the combination of social sciences and the economic analysis of the financial and risk mitigation instruments. This is because the social aims are influenced by the choice of the financial instruments and vice versa. The success of the financial instruments depends greatly on the social factors and the realization of the social factors depends greatly on the financial instruments chosen.

This relationship is shown in the graph below.

Figure 1 social goals versus financial instruments



The Social License to Operate (SLO), public engagement, and social acceptance are three relevant concepts with strong interdependencies, but it should be reflected that they are not completely the same / should not be used synonymously. They can be understood as three different perspectives looking at the same object.

They can be defined as follows:

- **Permission.** The SLO looks from the perspective of a developer / company. It is closely connected to the concept of corporate social responsibility (CSR) and describes the approach to act in a fair and inclusive manner in order to reach in addition to the legal or economical license to operate also the “permission” of the embedding social system.
- **Reaction.** Social/public acceptance describes the reaction of a social system (individual, resident, municipality, region) towards a specific acceptance object, in this concrete case the (energy technology) geothermal energy project. It is influenced by several factors which are related to the respective technology (e.g. risk perception).
- **Involvement.** Social/public engagement addresses the process perspective, which means a social system or parts of it being actively involved in a planning / decision making process (on different stages, and in different intensities). Financial participation can be understood as one special level of engagement. Additionally, public engagement can be seen as one factor influencing acceptance or as one component of a SLO strategy.

The aim of involving the community in geothermal projects through alternative finance can be to realize permission, reaction (acceptance) and involvement. But it can also be just to realize acceptance. The financial instrument and risk mitigation chosen can increase all three, but when chosen wrongly can negatively influence them as well.

4. THE CONCEPTUAL FRAMEWORK

The conceptual framework consists of several steps that help a project developer to determine why he wants to involve the community, what results he is hoping to achieve and what risk levels fit these goals. The questions are the following:

Step 1. Define the involvement goals.

Why does the project developer want to involve the community, what does he want to achieve by involving them?

Step 2. Define and select your community

Which community fits these goals of the project developer, who are the people that form this community? How can we define them as the target community for financial involvement?

Step 3. Define the community (risk) profile

What is the social and financial situation of this target community?

Step 4. Define the appropriate risk level for the financial instrument

What risk can the community absorb, and how does this risk absorption capacity potentially influence the conditions for the financial instrument and risk mitigation options?

Step 5. Define the finance and risk mitigation options

Which combinations of financial instruments and risk mitigation instruments fit the goal and community of the project and its developer?

4.1 DEFINE THE INVOLVEMENT GOALS

It is important to define the goals of the project developer clearly, when choosing alternative finance options. These goals will determine which alternative finance instruments are a good match and whether risk mitigation is needed or not. It is crucial to make clear choices as this is the only way to obtain clear answers and be able to choose the right financial and risk mitigation instruments. If an item is still undecided it is better to fill in the whole framework twice, one for each of the possible options, so different outcomes can be compared.

Possible objectives for the project developer for choosing community finance can be to tap into the value of the community of the project, to overcome bottlenecks, like complaints or obstruction which can delay the project, or to inform the community about the project and its possible benefits.

The added value of the community to a project can come in many different forms. The added value of involving the community can be:

- knowledge sharing
- promotion

- provide funds
- benefit sharing
- to show the commitment of the community for the project (which helps to get approval and support from the government etc.)
- possible better credit conditions for the project owners

Of course, the objectives of the project developer can be several of the above. It is most important at this stage to define which objectives are not on the project developers list and, if possible, to rank the objectives that are on his list.

To help determine the actual goals and to help the project developer into making clear choices the following questions can help:

Involvement goals questions

1. Do you want to increase the commitment of the community (and decrease the possibility of complaints or obstruction)?
 - a. Do you want acceptance of the project by the community?
 - b. Should citizens be activated for the project?
 - c. Do you want to give the community a say in the development of the project to increase their involvement?
2. Do you want to make sure the community receives part of the benefits of the project?
3. Do you want to raise funds?
4. Do you want to decrease the risk for community investors?

To illustrate the use of the questions here are some possible answers and possible consequences of these answers.

Examples

Ad 1. To for example increase the commitment, the community needs to feel involved. A financial instrument needs to fit their risk/return appetite to realize this commitment. If commitment is not a goal, alternative finance could be used for the raising of funds or to give the community a part of the benefits in the project, but this can be realized with a broader range of financial instruments.

Ad 1.c If you want to give the community a say, voting power is needed. This can be achieved through equity, reward-based financing, leasing constructions or (steward) ownership.

Ad 2. As is described in report 2.3 there are several ways in which benefits of the project can be passed on or shared with the community members. Both equity-based, and reward- or output- or revenue-based funding can be used to realize this. An example of reward-based funding is when community members receive the realized energy for a better price. To find the best way to realize a benefit for the community the risk of the project is important. Reward-based funding gives the community a physical reward, equity gives members a share in the profits. But if risk is high debt financing can be the best way to realize a benefit for the community.

Ad 3. If actual fund raising is an important goal for involving the community, then a risk sharing, or risk absorbing funding method can be useful as the trust of the community can convince other stakeholders to invest.

Ad 4. Especially if increasing of commitment or activation of the community is one of the goals the risk for community members should be carefully managed. Negative side effects caused by risk can mean the opposite of the goal is realized, namely a decrease of commitment or activation because community investors have lost their investment. This determines if risk mitigation instruments should be involved and to which level.

4.2 DEFINE AND SELECT YOUR TARGET COMMUNITY

After choosing the involvement goals the project developer has to determine which community, he wants to realize these goals for. This community will be his target community. They are the community which he will develop the alternative finance and risk mitigation instruments for.

The more precise the target community can be defined, the easier it will be to choose the instruments that fit this community well.

To define the target community the project developer can use the following steps:

1. A community and stakeholder analysis. Who are the different stakeholders around the project? What groups and subgroups are there? And what is their potential relationship with the project?
2. Whom of these existing stakeholders or communities do you want to choose as the target community for your community finance scheme? For whom do you want to realize the defined goals?

In this step the community will be contacted to obtain information. It is important to note that the approaching of a community should be handled with care. Keep in mind that no participation measure is trivial. Even the smallest opinion poll is an intervention that sets information and has an effect on the community. Annex 1 in this report gives some guidelines on a successful public engagement process.

4.3 DEFINE THE TARGET COMMUNITY'S RISK PROFILE AND WISHES

Once the target community has been defined, the next step is to determine their risk profile. The risk profile of a community consists of the risk absorbing capacity of the community and risk appetite of the community.

The risk absorbing capacity of members of a community can be defined as the possibility of the individual members of the community to be able to cope financially if the project fails and their investment is lost.

The risk appetite of the community can be defined as their interest and willingness to invest into a project with higher risk. Risk appetite can be fueled by the possibility of a higher return or the possibility of a desired goal to be reached. For example, the realization of sustainable energy.

It is important to mention that the risk appetite and risk absorbing capacity of community members do not always align. Community members with a low risk-absorbing capacity (for example because they have a low income) can have a high-risk appetite. This can be caused by a great desire to realize a sustainable energy source or an interest in a high possible return offered by a project. This last example especially forms a large risk for the community investors and for the success of the project. Investors who are attracted by a high possible return (most often seen in for example equity investments or high-risk loan investments) often do not realize that the high possible return is actually linked to the high risk involved. This means that the probability of the high return actually being realized is considerably lower than the chance of realizing lower returns in lower risk projects. The high risk involved is exactly the reason why the high potential return is being offered.

In this case it is very important to make investors aware of the risks involved and possibly only offer low risk alternatives.

A combination of a high risk-absorbing capacity and a low risk-appetite can also occur but does not pose a risk to community members so is less worrying. It can mean that the chances of successfully funding the project with this investor community can be lower.

The risk profile of a community is influenced by the following factors:

- Socio-economical context
- Historical context
- Vision renewable energy goals) of community members
- Political context
- Knowledge on geothermal/energy topics
- Homogeneity of the community. Are there different sub-groups and do they have very different opinions?

Next to the risk profile it is of course also important to discover what the wishes of the community are concerning the project. So, what is the selling point of the project for the community.

- Do they want sustainable energy?

- Ownership of an energy source?
- Better service?
- Or a financial return?

These wishes also form the risk appetite of the community. How much risk are they willing to take to realize their own goals, or wishes, in the project?

When the community's wishes are known and the risk profile is clear we can define the risk absorbing capacity and the risk appetite of the community. This combined makes it possible to determine what the risk goal is for the community in the project. In other words: what risk is desired and acceptable for the community investors in the project?

In the CROWD THERMAL project a protocol has been developed to determine what community members expect of the project and what they hope it will achieve³.

The developed protocol could be used to determine the profile of the target community and their aims and wishes concerning the project. Not in the least by determining which part of a potential community would be interested to become part of the project, so form the target community for the financial instrument and possible risk mitigation.

4.4 DEFINE THE APPROPRIATE RISK LEVEL FOR THE FINANCIAL INSTRUMENT

Now that the involvement goals have been selected and the target community and its risk profile are clear it is possible to determine the right risk level for the financial instrument and accompanying risk mitigation instruments.

To be able to do this we first have to collect all the assembled 'risk data'. Both from the steps we have done and from the characteristics of the project itself. For example the amount of capital needed and the project phase investment is needed for.

In short, we should be able to answer the following questions:

1. What is the risk absorbing capacity of the community?
2. What is the risk appetite of the community?
3. What is the risk goal for the community?
4. What is the risk appetite and risk absorbing capacity of the project developer?
5. What is the risk level, financial risk and amount of capital needed for the project phase that is going to be using the community finance?

With this information we can determine the correct risk level for the alternative finance instruments that will be used for the project.

The first three questions have been answered in the conceptual framework steps 1 to 3. For number 4 the project developer must assess their own risk appetite and risk absorbing capacity. This depends mainly on the financial structure of the project developer, and the (resource) risk of the project. As this report focusses on involving the

³ See the Case assessment protocol designed in WP12, Task1.4

community, we will not describe this process here. For the fifth question we can draw on CROWDTHERMAL Deliverable 3.2 “Alternative Finance Risk Inventory”.

In Report 3.2 chapter 5, three financial characteristics have been defined for capital used in geothermal projects and for the project phases of a geothermal project. All of these are influenced by or defined by risk. The financial characteristics are:

4.4.1. The type of capital required.

Four types of investment capital are distinguished:

1. risk absorbing
2. risk-sharing
3. debt
4. reserves.

Some geothermal projects, or project phases require capital that not only shares the risk but also takes over some of the project developers’ risk if the project goes wrong. This is so-called risk absorbing capital. Other projects, or phases need capital to assume part of the risk, sharing it with the project developer. The third group does not need the capital to share in the risk as such. This can be funded through debt instruments or its own contained reserves. Other project phases can be financed by using debt financing or reserves. More information on these types of capital and their use can be found in deliverable 3.2

4.4.2. The financial risk in a certain phase.

The financial risk is always defined by the chance that the investment will be lost in this phase. Three general levels of financial risk can be defined: (1) low, (2) medium and (3) high.

4.4.3 The relative amount of capital

Different phases in a geothermal project require different amounts of capital. Some phases require a limited amount of capital, some a larger amount. Capital-intensive phases usually mean more risk as the repayment pressure is larger.

Using these 3 characteristics Table 1 taken from deliverable 3.2 ⁴, shows the risk levels of the different project phases. We have repeated it again here for reference:

Table 1: Financial characteristics per geothermal project development phase

Project Phase	Type of Capital	Financial Risk	Capital required	Suitable (Alternative) Finance Methods
1. Project Definition	Risk-absorbing, Risk-sharing	High	Low	Subsidies/grants/donations, crowdfunding (E/R*), direct lending combined with governmental guarantee, governmental lease
2. Exploration	Risk-absorbing, Risk-sharing	High	Medium	Subsidies/grants/donations, crowdfunding (E/R*), direct lending combined with governmental guarantee, governmental lease
3. Drilling A) First Well	Risk-absorbing, Risk-sharing	High	High	Subsidies/grants, crowdfunding (E/(L)/R*), governmental lease, direct lending combined with governmental guarantee, green bond, regular loan, regular bond, equity
B) Resource Development	Debt	High/Medium	High	Crowdfunding ((E)/L/R*), governmental lease, direct lending, green bond, regular loan, regular bond, equity
4. Construction	Debt	Low	High	Crowdfunding (L/R*), direct lending, leasing
5. Operation	Debt	Low	Medium	Crowdfunding (L/R*), direct lending, leasing
6. Decommissioning & Post-Closure	Reserves, Risk-absorbing (Government)	Medium	Low	Retained profits, governmental funds

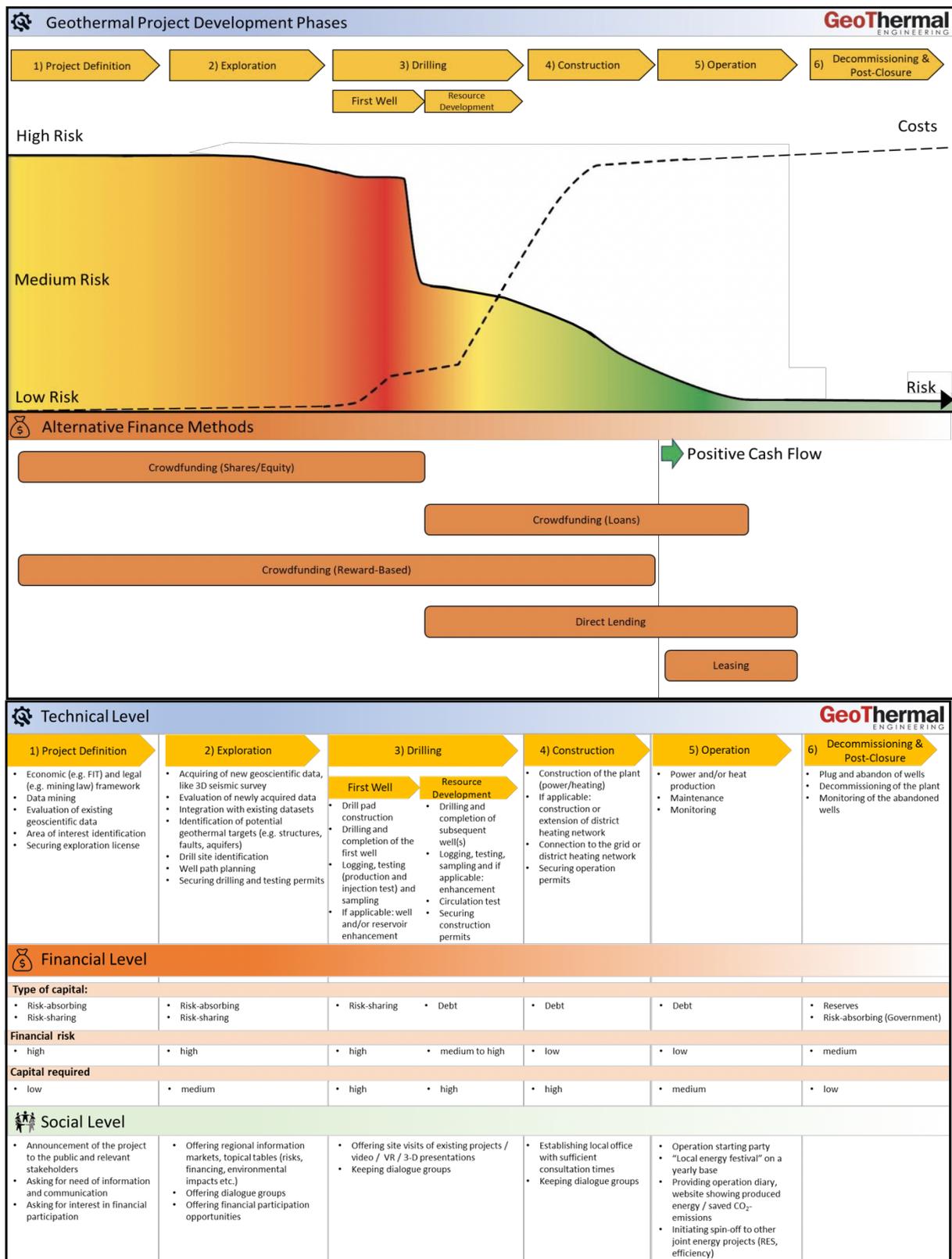
* E=Equity, L=Loan, R=Reward-based

The most important part of this table for our framework is the information in the three middle columns. This gives us the type of capital, the risk of the project phase and the amount of capital required. This is the last information we need to be able to determine the risk level of the financial instrument we are looking for.

Also repeated from CROWD THERMAL Deliverable 3.2 below is figure 2. This figure shows a graphical interpretation of the relationship between the technical geothermal project

⁴ CROWD THERMAL deliverable 3.2 “Alternative finance risk Inventory” chapter 5 table 1 (page 21), retrieved from: https://www.crowdthermalproject.eu/wp-content/uploads/2020/09/CROWD THERMAL-D3.2_FINAL_GeoT-200831-copy.pdf

development phases, associated risks, costs and the social levels of engagement. It also includes a general idea of possible financial instruments suited for a certain phase.⁵



⁵ CROWDTHERMAL deliverable 3.2 alternative finance risk inventory chapter 5 figure 2, page 22 (modified after ESMAP 2012 and ALTFinator.eu 2020)

Figure 2⁶ Technical geothermal project development phases, associated risks, costs and most appropriate alternative finance methods.

If we combine all this risk data, we can determine what kind of combination of instruments we are looking for. Are we looking for a risk absorbing instrument, a risk sharing instrument, or a neutral instrument like debt? Or is no risk element needed from the capital? And when this is determined which level of risk participation would satisfy the community's and project developer's interest best? With this information finance and risk mitigation options can be determined in step 5.

Important note: the possible alternative finance methods mentioned in the 4th column of table 1 are just an indication. They do not look at social factors or involvement goals and do not include possible financial risk mitigation instruments.

4.5 DEFINE THE FINANCE AND RISK MITIGATION OPTIONS

Now that we know the risk level we are looking for, we can match this to different combinations of alternative finance and risk mitigation instruments.

Our aim in this step is to:

- Optimize risk/return/commitment ratio for both community investors and project developer.
- Match the financial instrument/risk mitigation to risk appetite and risk absorbing capacity.

As a first step to make possible choices visible, we can classify the different alternative finance instruments, selected and described in CROWDTHERMAL Deliverable 2.3, according to their general risk level. Table 2 gives an overview of the different alternative finance instruments. More information and a further explanation on these instruments can be found in deliverable 2.3.

Crowdfunding
Crowdfunding (shares/equity): Financing model where a business raises funds from investors directly without going through a bank in return for equity/shares in that business.
Crowdfunding (loans) (also known as peer-2-peer lending): Financing model where a business raises funds from investors (without going through a bank) in return for a loan.

⁶ Technical geothermal project development phases, associated risks, costs and most appropriate alternative finance methods (modified after ESMAP 2012 and ALTFinator.eu 2020).

<p>Crowdfunding (reward-based): Financing model where a business raises funds directly without going through a bank in return for non-monetary rewards, like products</p>
<p>Direct lending. Direct lending is when a loan product is provided by a financial institution that does not have a banking license. This can be provided in different forms</p>
<p>Leasing</p>
<p>Operational lease: An institution provides the funding for a project to parties who are developing the project. The parties pay it back in periodic installments. At the end of the project, the facilities are owned by the institution.</p>
<p>Financial Lease: A leasing company pays for assets and/or production of a project for parties who are developing the project. The parties pay it back in periodic installments. At the end of the project, the facilities can be bought often at a price agreed in advance.</p>
<p>Match funding. Match funding is when there is funding from a crowd, bank or direct lender and a government source adds its own (matches) funding to increase the total amount.</p>
<p>Green bonds Green bonds are fixed-income instrument that are specifically earmarked to raise money for climate and environmental projects. They can be funded by the crowd, through a direct lender or by a bank.</p>
<p>Social Impact Bonds Social impact bonds are pay for success financing instruments for projects that will create better social outcomes whereby the payment to investors is flexible, based on the achieved savings.</p>
<p>Revenue based financing Any form of financing (loan, equity, crowdfunding) which raises funds in return for a payment of part of the revenue generated with the investment</p>
<p>Reward based financing Any form of financing (loan, equity, crowdfunding, grant) which raises funds in return for a non-monetary payment. In products, experience or discounts. Reward based funding has been mentioned under crowdfunding but is also possible when financed by other parties then the crowd.</p>
<p>Grants and donations Funding, usually by a government or NGO where no repayment in any form is required.</p>

Table 2: Possible alternative finance instruments

In the next table, table 3 The methods are ranked and classified by risk categories. Firstly, by the level in which the instrument in general is risk absorbing, risk sharing or debt or reserves. Secondly by the level of risk it carries for both project developer and community.

Risk ladder	Risk profile	Community risk	Project developer's risk
Alternative financial instruments			
Grants and donations	Risk absorbing	High +++++	Low-----
Reward-based financing	Risk absorbing	High +++	Low ----
Social bonds, green bonds	Risk absorbing	High+++	Low---
Equity (crowdfunding)	Risk sharing	High +++	Low---
Revenue-based financing	Risk sharing	High++	Low---
Output-based financing	Risk sharing	Medium ++	Medium--
Operational lease, ownership risk lies with owner/developer. Users "rent" the asset	Risk sharing	Medium++	Low
Loan products (e.g. crowdfunding (loans), direct lending)	Debt	Low--	High++
Financial lease (risks lie with user/community)	Debt	Medium++	Low
Match funding	Debt/risk sharing/risk absorbing	Depending on character	Depending on character
Retained profits	Reserves	Low-----	Low-----

Table 3: Alternative finance risk ladder

The risk in the table is classified on a scale from low risk through medium to high risk. Plusses and minuses are used to indicate how high or low the risk is for the party concerned. For example, the lowest risk would be described by: 'Low-----'. Very high risk would be described by 'high++++'. A slightly less high risk would be 'high ++'

As you can see the level of risk for community investors and the project developer are inversely related. A higher risk for the developer means a lower risk for the community investors and vice versa.

As a second step we classify the possible risk mitigation instruments. Different risk mitigation instruments can be combined with different alternative finance instruments as is described in CROWD THERMAL Deliverable 3.3. In the table below we give an overview of combination possibilities and risk level effects realised by the different risk mitigation instruments.

Risk mitigation instruments	Can be combined with	Risk reduction capacity
Grant/subsidy	All community finance methods	+++
Guarantee	Loan-based products: Social bonds, green bonds, leasing, loan products	+++++
Match funding	Loan products, leasing, maybe equity instruments	+++
Insurance	All community finance methods	++++

Governmental lease	Lease by the community/operational user	+++
Buy back options (alternative form of operational lease)	Equity, reward based, output based, revenue based	+++

Table 4: Risk reduction capacity of risk mitigation instruments

These two classifications can be combined to create different risk levels for participants in the project. To give an example:

- An equity investment means a high risk for community investors. This could be improved by insurance or a government buy back policy.
- A debt instrument in a high-risk phase of a project can mean high risk for the project developer and at the same time for investment community members. While in general a debt instrument is a low-risk instrument. The high risk is caused by specific characteristics of geothermal projects. Because the chance of project failure, an associated loan default is relatively high. A guarantee can reduce the risk for the community, increasing the possibility of raising debt for the developer.

Now in this last step we combine our risk data with the risk profile of the different financial and risk mitigation instruments and construct different possible combinations that match the characteristics of the project developer, the community and the project (phase, risk and size).

As said at the beginning which combination of instruments matches any project and its community and developer depends on all the factors involved, both social and financial. This means it is difficult to advise certain choices for situations in a general sense when not all facts of an individual project are known. A case-to-case approach using all the relevant factors is essential for the success of the community finance part of the project.

4.6 AN EXAMPLE

As said, general rules cannot really be defined because there are a lot of factors. To demonstrate the working of the framework however we can describe an example testcase to illustrate the use of the framework. We cannot give all the answers as especially the community characteristics are difficult to assume but we will fill it in making a number of presumptions just to show how the framework works.

For the example we take a project developer who is in the exploration phase of the project and is considering the use of community funding to involve the community further in his project. This means there is still substantial risk in the project and regular bank finance is hard to obtain.

Step 1. Define the involvement goals.

Let's assume this project developer wants to increase the social acceptance, social license to operate and the involvement of his community. This means he wants them involved in

the decision process, if they want to be. If in prioritizing his goals the social goals are more important than the financial goals, a good risk mitigation is essential.

Step 2. Define and select your community

Let's assume that he wants to target the community living in the vicinity of the project, which is not a very strong one, both socially and financially. Selecting this as target community will mean the potential to raise funds is limited. If the involvement goals are mainly social this does not necessarily pose a problem for the project developer.

Step 3. Define the community (risk) profile

The risk absorbing capacity of this community is not very high as their financial position is not strong. Their risk appetite will depend on another very important factor. The motivation of the community. Do they want to be involved in the project? If so, then for what reason? Are they motivated by the possibility of cheaper energy, the sustainability goals, or possible financial benefits? Let's assume here that it is the sustainability goal that motivates the community. Looking at their financial situation, their risk appetite would be on the low side as they find realizing sustainable energy worth investing but do not have the financial position to be able to absorb large losses. This means risk mitigation would be a good idea.

Step 4. Define the appropriate risk level for the financial instrument

The information gathered in step 3 shows us that the risk appetite and risk absorption capacity of the target community are low. Because the project is in the exploration phase, the risk of the project is high. The risk absorption capacity of the project developer is probably also limited in this phase. So is his risk appetite, even more so as he wants to realize maximum benefits for the community.

Looking at these risk data, risk-absorbing or risk-sharing instruments would be the most suitable from the project developers' point of view. From the community point of view an instrument with lower risk would be better, like debt or leasing. This discrepancy can be solved by adding a risk mitigation instrument.

Step 5. Define the finance and risk mitigation options

To illustrate possible instruments, we can use the risk ladder in table 4.4.

Looking at the risk ladder the project developer would have a preference for crowdfunding equity, reward or revenue-based funding or a social or green bond. With these instruments he can really involve the crowd, give them a say, especially with equity crowdfunding, and realize some risk-absorbing or risk-sharing capital. Readers may wonder if donations are not an interesting option. Purely from a risk point of view donations are always interesting. However, donations do not realize the involvement of the community which the project developer wants in this example.

The community however will probably not be that interested in these options as the risk for them will be high with these instruments. So, it is advisable to combine the finance instrument with a risk mitigation instrument.

Looking at table 4.5, we see that the best fitting risk mitigation instruments in this situation would be a guarantee, insurance, or a buy back opportunity. If (part of) the investment for

the community is guaranteed in case of failure of the project, they would probably accept the (reduced) risk. They are a motivated community who would like to realize the sustainable energy and would want to be involved.

A guarantee or insurance would reduce risk. A guarantee however usually only works with a loan-based instrument. So, with a crowdfunding loan or a social or green bond. The reason is that with equity or reward-based and revenue-based instruments it is very difficult to estimate the value of the returns missed. An insurance could work, but also usually only with loan-based instruments. An insurance could possibly work with equity instruments but again as the value of equity is hard to determine this is not usually on offer unfortunately. As the same valuation problem arises. A buy back opportunity would work if a government or other party would buy back the instrument community investors bought. Of course, the expected revenue would still be lost.

An alternative could be to look for a party who would fund the first phases and then lease back the project to the developer and the community. In which case the risk would be carried by this party completely.

4.7 POSSIBLE STRATEGIC INVESTORS

Part of the task description of task 4.3 was the identification of possible strategic investors financially strong enough to provide sufficient equity for geothermal project development. First option of course, is generally a local or national government. Governments have targets to reach in sustainable energy and can create instruments to give project developers a guarantee or grant or donation. Unfortunately, not all government have programs to do that. Secondly large insurance or oil companies could be interesting options. This subject will be handled in deliverable 4.6

5. CONCLUSIONS

Now the whole framework has been described we can draw the following conclusions:

1. A lot of different factors are involved when choosing the right alternative finance and risk mitigation instruments. Social research and financial knowledge must be combined as the social aims are influenced by the financial instruments chosen and vice versa.
2. The research should start with determining the involvement goals of the project developer, after that the target community for the financial and risk mitigation instruments should be selected. The next step is to define the community's risk profile. After that the appropriate risk level for the instruments can be determined after which possible combinations that fit all the project's criteria can be chosen.
3. A case-to-case approach is important as lots of different combinations of the individual factors are possible. It is crucial to look at the exact combination to determine possible instruments.
4. The risk of certain instruments is usually inversely related for the project owner and community investors. Both risk appetites have to be taken into account to realize a good match.

5. The risk absorbing capacity and risk appetite for both project developer and community are very important when choosing the best combinations of alternative finance and risk mitigation.
6. The wishes of the community however are also very important. Whether the community wants ownership, sustainability, a profit or better service will determine how they want to get involved in the project.
7. Not all combinations of risk mitigation instruments and alternative finance instruments result in the desired decrease of risk for community investors. Only certain combinations are effective.
8. Risk mitigation can change the possible use of alternative finance instruments and increase the possibility of realizing the wishes of both community and project developer.

6. RECOMMENDATIONS

Based on the findings in this report we would like to make the following recommendations:

1. Do not copy past successful alternative finance and risk mitigation combinations from other projects without research. If the circumstances in your project are different, the success may not be the same.
2. Beware every action has an effect on your target community, even a survey starts involvement.
3. Even if community involvement is not high on the agenda, informing the community will always benefit the project and can be seen as a basic precondition for acceptance. So, it is strongly advised to have an open communication.
4. Risk mitigation can be a very powerful tool to facilitate community involvement and support in geothermal projects. The European Union and member states should research the possibilities of developing more risk mitigation solutions for geothermal projects so the involvement of communities can be increased.
5. The risk mitigation mechanism developed in CROWD THERMAL work package 3 should be investigated as a European level instrument to increase the success of geothermal projects.

Planning Engagement

What determines the success of a public engagement process?

First and foremost:



Not the instrument itself (e.g. the survey, the citizens' council, the public hearing) is the most important determiner, but rather **the analysis of the context of the system**, into which there is planned to integrate a certain technology or with whom there is the desire to jointly develop a certain technological solution.

The analysis should be conducted before choosing the instrument for public engagement.

Some principal questions to ask for in order to set a framework:

❑ **What exactly is/should be the topic of the engagement process?**

- As a first step in order to define what exactly the goal of the engagement process is, it is important to get a clear vision of which part of the project respectively which topic is aimed at for the engagement process.
- Therefore it is also helpful to specify on which level the engagement is supposed to take place (e.g. state capital administration, a certain district, all citizen)

❑ **What is the goal of the planned engagement process?**



It is important to **set realistic goals**. As an example: it might be the best case to involve everyone and let them join and participate in the project. But it should be safely guaranteed that there really is a realistic chance in engaging all citizens. When setting up a survey with the question "would you be interested in financial participation?", it should be sure there is the possibility to do so in any kind of way. Otherwise you create false expectations.

goal of a participation process could be:

- **Is acceptance to be achieved?**

⁷ This annex was prepared by the Leiter Arbeitsfeld Umweltpsychologie department of IZES gGmbH

- Acceptance for what and from whom?
- **Should citizens be activated for the project and further climate protection actions?**
 - For what exactly?
- **Should financial participation be encouraged?**
 - Which type? Which offers exist?
- **Should conflicts be reduced?**
 - Which conflicts are there?
 - Which conflicts are expected?
- **Should a procedure gain legitimacy or be secured in this respect?**

▣ **What resources are available for the participation process?**

- Always reflect while thinking about potential steps/methods:
 - **How do possible individual steps help to achieve the goal?**
 - Which stakeholders need to be addressed?
 - In the case of a population survey: what happens to the results?
 - In the case of a yes/no vote: how strongly does one feel bound to the sentiment?



Keep in mind that **no participation measure is trivial**. Even the smallest opinion poll is an intervention that sets information and has an **effect** on the people.

Contextual Analysis/Contextual Factors

As mentioned above, the analysis of a systems context is important to choose the right measure for public engagement. Factors that need to be considered are listed below.

Community and Stakeholder analysis (Who is there?)

Socio-economical context

Historical Context

Vision (Renewable energy goals)

Political Context

Methods preparing public engagement

There are different methods that concretely help to prepare public engagement processes. The most common ones are listed below.

Stakeholder map

Media analysis

Interviews/Surveys (Recommendation: Application of interviews and surveys)

ANNEX 2. CONTACTED CASE STUDIES FOR TESTING

Case study: Hungary, Szeged, Tarvan II heating service, Tamas Medgyes.

Together with Tamas we analyzed possibilities for community funding in Hungary. Limiting factor is the Hungarian pricing regulation, which hampers incentives related to normal equity crowdfunding and makes it uninteresting financially for suppliers to invest into geothermal energy. A possibility could be to use reward-based crowdfunding for smaller projects. Hungary has prepared a potential case study for the heating company in Szeged which we will look at.

Case study Spain, EAI310 building, Marcel Hendriks

The project itself is finished. Community funding was used as the community was the project owner. Maximum involvement and vote for the community were realized this way.

Case study Iceland, Eimur, Otto Eliasson.

The case study is at the beginning so ideal to test the conceptual framework and the use of the financial and risk mitigation instruments. The project developer is now working on defining the exact type and form of the project. The next step will be calculating a business case. And after that to approach the community and possible subsidy/grant parties. We will continue to help the project, the actual selection of the financial instruments, and thus the testing, will happen in a later phase.

Case study Northern Ireland, Belfast and Edenderry, Joseph Ireland and Rónán Davison-Kernan

Two possible interesting cases have been defined in Northern Ireland. Both case studies are at the beginning so are ideal to test the conceptual framework. Our involvement will continue.

ANNEX 3 MONITORING OF THREATS AND OPPORTUNITIES

In the CROWDTHERMAL project several tools are developed to increase the social engagement in geothermal projects, one of which is the use of community finance methods. We are learning things during the CROWDTHERMAL project that can form new opportunities or new threats concerning the goals of the project: increasing community finance and social engagement in and for geothermal projects.

By combining the research concerning the social engagement and the community funding we find new important lessons that are essential for the success of future geothermal projects that want to engage the community and use community finance successfully. Both new opportunities and new threats can be seen that should be taken into consideration in the future. Task 4.3 wants to monitor this new knowledge and use it for the core services that are being developed.

For this task we want to answer the following question:

What do we learn if we combine the social engagement and financial research and how can we use this knowledge to realize maximum trust and community engagement when using community finance in future geothermal projects?

To find the answer to this question, we started with several meetings with key players of the consortium to identify possible threats and opportunities that we had already seen. This was followed by a workshop with the whole consortium in which we discussed the first findings and possible others. Most of these threats and opportunities have already been incorporated into the different core services of the project.

This list gives an overview of all the possible threats and opportunities the consortium members have defined.

1. Before approaching the community, a project owner should ask himself what his goal is in involving the community. Through community finance the community can be involved with four possible goals:
 - To increase the commitment of the community (and decrease the possibility of complaints or obstruction).
 - To give the community a say in the development of the project to increase their involvement.
 - To make sure the community receives part of the benefits of the project
 - To raise funds.⁸
2. The identity of the project owner decides in which way CROWDTHERMAL results can be used. If the community is the project owner not all steps in the decision tree and the conceptual framework for finance and risk instruments will be useful and there are different hurdles (for example getting the commitment of the government).

⁸ This aspect has been implemented in this deliverable 4.3

3. Knowing the community and shaping the solutions around them is the key to success. It is important to empower them and trust is crucial.⁹
4. The financial and social situation of the community is an important factor when deciding which form of community funding should be used and if it should be combined with risk mitigation instruments. It will decide the possible success of community funding.
5. It is important to set realistic goals for the involvement of and financing by the community, which also match the wishes of the community itself. As an example: it might seem ideal to try and involve everyone and let them join and participate in the project. But it should be realistically possibly for them to actually participate.
6. It is important to see the community as an opportunity and not as a threat. So involvement should be a positive process.
7. In the process around a geothermal project there are different angles. The project developer, the community and the local government should all benefit from the project. In some projects it may be the local government that needs support to realize the maximal benefits in the project.
8. The bad press of a project with community involvement that goes wrong could damage the entire sector. This is an additional reason to manage the risks properly for the community.
9. It is important to include the relationship with other sustainable energy sources in the project analysis. If they are serious alternatives this will influence the way geothermal energy is perceived. Possible synergies can also be interesting.
10. An important difference between geothermal energy and other sustainable energies is that geothermal is more fixed to one place. So also, more dependent on the goodwill of one local community. For community involvement and finance the project can also look elsewhere but acceptance of the local community is essential.
11. What are important factors for local authorities to involve themselves in a geothermal project? Knowing this could increase the chance of success.
12. Governments may be convinced to be more involved more often. This would make successful risk mitigation more feasible for both the project developer and the community.

⁹ This point has been implemented in this deliverable 4.3

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