



Increasing policy makers' awareness and public acceptance ***Conclusions of the Workshop***

1. Introduction

It is widely known that the geothermal energy is a versatile renewable energy source that is among the cleanest of the commercially viable technologies available today. Towards this direction, there has been a lot of literature attestation. However there has not been the predictable development in this field as it is for most other "alternative" energy sources. An important reason is that many geothermal projects face strong opposition from politicians, neighbouring communities or environmental pressure groups. This is why there is a global tendency for geothermal companies to develop their policy and their social responsibility. The aim of this paper is to make policy makers' aware of the need of a strategy and examine the policy that should be followed in order to eliminate any social opposition by analyzing the reasons for generally weak social acceptance and identifying possible solutions for changing the situation.

2. Current situation - Reasons for weak social acceptance of geothermal projects

Nowadays it is unexceptional that geothermal energy has many advantages in comparison with the other renewable energy sources. However solar, wind and biomass are accepted more as new scientific achievements which offer numerous benefits to society, and which are perceived to be more friendly to the environment. These renewable energy sources have faced also opposition from local communities but not as strong as the geothermal energy projects. This is why these alternative energy sources have quicker development rates during recent years than the geothermal energy source.

But why is it like this?

What are the mistakes made in geothermal energy promotion up to now in order to recover the present situation and enable better conditions for further (quicker) development?

Which are the positive and negative case histories?

In this paper an effort shall be made by policy makers' to analyze the reasons for generally weak social acceptance in order to identify possible solutions for changing the situation.

The main reasons of this situation are:

1. The initial phase of project development
2. The environmental impact
3. The public acceptance
4. The political acceptance
5. The technologies that are used for the geothermal energy applications



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2.1. The initial development

The initial phases of development of a geothermal project often begin test drillings (often on residential properties) with dirty, noisy equipment; and without contact with, or involvement of the local people. Then, steam or hot water comes to the surface, again resulting in dirty surroundings (bad smell, scaling, corrosion of used materials), and sometimes unregulated flow of water through the property. As a result, difficult questions arise:

- What shall happen with the balance of the underground water with this large artificial flow? The balance is important for many reasons, including fresh water supply, and crop irrigation. Scientists are saying to the locals that there is no reason for fear because the steam or hot water is coming from deeper horizons
- Is it certain that emptying the underground water reservoirs will not trigger additional earthquakes? Is the word of a scientist who doesn't live in the region, a good guarantee that natural balances will not be disturbed?

After the initial completion of a geothermal system, local people and politicians have, in front of their eyes, a system of irregularly located boreholes, pipelines passing through properties in a "strange" way. Therefore, in the initial phase of development, benefits are not obvious, and appear to be outweighed by negative changes to the surroundings.

Some problems during early development came from the fairly bad experiences in another field or countries where due to the lack of regulatory frame did not follow any environmental and social protection issues. Nowadays the regulatory frame around the world is more strictly and the main problem is to convince to the local people that the developer will be able to follow the regulations.

2.2. The environmental impact

Taking into account that people usually do not have a clear understanding of what types of impacts are coming with the introduction of this "new" energy source, there is primarily no resistance during the initial phases of development, i.e. exploration, investigation, and project design phases. The differing opinions of local people depend on several local factors, including socio-economic conditions, cultural background, and individual or group interests.

When news spreads about the possibility of having a geothermal project initiated in a given area, many residents eulogize natural heat with terms like clean, cheap, friendly, benign, green, and sustainable; thus creating a favourable climate for the implementation of the project. However, individual and collective attitudes towards geothermal development usually change with time as the project reaches the drilling stage, and work begins for plant construction.

Moreover, reaction often grows against landscape modifications and alteration of natural features of cultural or religious interest, caused by civil and industrial works and by changes in the use of public areas resulting from project activities.



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For all the above reasons, opposition by residents in the project area often increases as the project proceeds, especially in areas with resources suitable for geothermal-electric generation. Thus, the number of people who label geothermal energy with terms such as costly, polluting, and dangerous for people's health also increases. Furthermore, in areas with different energy options, opposition to geothermal development can be used as reinforcement by parties interested to foster the use of energy sources other than natural heat.

Normally, the geothermal development cause several change or modification in the surrounding area that could be positive or negative. The positive effects are improvement of the access roads and facilities (water supply, electricity, communications, etc.), the geothermal development could also increase the local jobs, general commerce and in general the social and economic development of the surrounding area. Perhaps the best way to do the geothermal development is to reach a perfect balance between the positive and negative aspects but no affecting the economic feasibility of the project.

2.3. The public acceptance

Sometimes geothermal energy projects, both for electricity production or direct application, result in changes to the social environment and this is why public acceptance is in question. For example:

- Building of a large industrial plant for electricity production with complicated infrastructure. New people with higher living standards and different ways of life move into the area. Young locals leave the traditional local economy and way of life by getting these better paying jobs.
- Introduction of new and different economic sectors, based on low-energy costs from the use of a new energy source. Often this creates strong competition to the existing traditional production (greenhouses, aquaculture). Perhaps "joint venture projects" could be a possible alternative to improve this development.
- New buildings and houses appear in the traditional environment, resulting in changes to existing estimations of values.
- Feasible economic benefits are coming, but only for a limited number of people.

On the other hand, usually, better life infrastructure and organization comes with a new project, i.e. better road connections, potable water supply, better management of the effluent water, better supply to the local market with everyday goods, etc. The type of social acceptance in a local community depends on the level of culture and existing economy, but also on the organization of the initial approach to development of the new economy sector.

2.4. The political acceptance

Political acceptance is very important because real geothermal development cannot begin without strong State support. However, this is one of the weak points of the public treatment of geothermal energy, due to several reasons:



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- Development of a geothermal project lasts for a long time, i.e. the results are realized after 10 or more years from the beginning of activities. That may be too long a period for local politicians needing short term results, and even for the State having on hand other short term and less capital intensive possibilities.
- Technologies mostly use products and equipment designed for other uses, so essentially there does not exist a "geothermal" industry needing political support for its existence and further development, except for geothermal heat pumps where the development is fastest.
- There is no widely accepted strategy for scientific and commercial promotion of the "new" energy resource. It is understood as important only in a few (rich) countries at higher cultural levels, and with good State organization, where long term planning has higher priority than short term solutions.

Countries where any or almost any oil or gas resources exists it is more easy to convince to politicians to help the geothermal development because this energy is indigenous and relatively less expensive than oil based energy.

Normally to begin the exploitation of the field take large time which is mainly due to award concession/permits and the time to do the drilling and the test of wells. We are confident that the geothermal development could spend at least three years to complete all the phases.

2.5. The complex technology

Absence of simple and easily applied technologies is also one of the reasons for weak social acceptance of geothermal energy as a competitive energy source. In addition, absence of standardized technologies, materials, and equipment result in the absence of industrial support.

The complex and expensive technology is perhaps the reasons, the geothermal industry and in especial the drilling technology due to is coming from the oil industry is normally complex and expensive. In the oil there is not big problem because they spend large quantity of money in wells which can be easily recovered considering the actual oil price. In the oil industry, almost 100% of the energy content has been used but in the geothermal it is 8-10%.

3. Possible solutions for changing the situation

- *Initial development.* It was found that many elements of the complex nature of geothermal energy can be the reason for weak public support in some areas. A lot of work is necessary to change the resistance by spreading honest information in an understandable way, accommodated to the culture and cultural level in question.
- *Environmental impact.* Development of most, and particularly the big geothermal projects have environmental impacts. Elements of the impact can contribute positively or negatively to local public opinion, depending on the quality of the organizational approach of project development, quality of project design, organization of work during construction and completion, and quality of the operations. General positive opinion can be reached when most of the elements are done in a proper way.



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- *Social acceptance.* As the changes to local life and habits, introduced by geothermal energy project development, get bigger in a specific area, it is more difficult to get quick social acceptance – even if resulting in quick and favourable benefits to the community. Sometimes, it's better to start with smaller projects to accommodate local people to the presence and benefits of a new energy source, than to go immediately into completion of big projects. However, if taking the responsibility to resolve some urgent problems of the community in parallel or, better said, as a part of the project completion, chances to accelerate the process of public acceptance are much better. Increasing local development will also contribute to this direction.
- *Political acceptance.* Political support for geothermal development is important as a support to get public acceptance and as support to get necessary State support for the initial development phase.
- *Technologies for geothermal energy application.* Close collaboration with local population providing honest answers to their questions and concerns, accompanied by educational activities to the general public and schools seem to be a good practice towards spreading understanding of the technology to local population.

In addition, social acceptability is one of the most important parts of the process of geothermal energy development in a specific environment and should be taken into account. In order to attain social acceptability, the project activities should not result in drastic changes from the regular conditions of the area, and the affected sectors should be able to see some advantages issuing from the project. Social acceptability of a profit-purported project is the condition upon which the technical and economic objectives of the project may be pursued in due time and with the consensus of the local communities which can be gained by acting in consonance with the dynamic conditions of the environment, and in the respect of the people's health, welfare, and culture. It is not possible to complete a successful project if initially not identifying the elements of the local environment, which can influence its social acceptance and not designing honest organizational, technical, economic, and other solutions in order to prevent the development of negative opinions.

When starting a geothermal project, careless practices may result in initial negative impressions to develop quickly, and the re-establishment of good image may need large investments in effort and time.

- Proper technical/technological and organizational solutions should be applied for all phases of project development, (exploration, planning, design, implementation, technical acceptance, trial work, operations and maintenance). Furthermore, before starting the work for project implementation, all the elements of social acceptance within the local environment should be identified, with honest solutions to prevent the appearance of negative opinions, and plan to communicate the benefits.
- Education programs can be really helpful in order to make geothermal energy more friendly and accepted by children and their communities in general. Educative materials can be prepared for students and professors with suitable style. Programs of this kind of material referring to groundwater with respect to its protection in quality (polluting processes, marine intrusion) and its protection in amount, introducing the concept of sustainable use can be also used.
- Geothermal regulation should be also taken into account. It is apparent that the present lack of regulation for geothermal energy exploitation over most of the EU is



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inhibiting the effective exploitation of this underutilized resource. The process is planned to outline and encourage investment in geothermal energy by private and public sector partnerships. Furthermore lack of clarity or inadequate regulation can be as restrictive as no regulation.

Measures that have been successfully applied have included the following:

- Enforcing legislation separating geothermal resources from the mining code
- Demonstration of very small scale geothermal pilot power plants (a few kWe)
- Providing strong incentives to investors
- Communicating positive impact of geothermal development through independent experts
- Educating local society and company staff
- Communication best practices by inviting local journalists to foreign geothermal power plants

4. Conclusion

Nowadays it is obvious that successful geothermal companies and governments are trying to develop their policy and their social responsibility during development of new geothermal plants. They are also making an effort to develop a strategy and examine the policy that should be followed in order to prevent the development of bad image and social opposition, which is attributed to the fact that sometimes geothermal projects do not meet the expectations for clean and environmental friendly energy supply. The policy that these companies and these governments have successfully followed, should be taken into account as a positive example for all the geothermal community so that geothermal energy will attain more quickly the development it deserves.