

**GEOCOM CONCERTO Project****Difficulties, Barriers, Problems and Challenges**

Mórahalom Municipality has always kept it really important to spread renewable and alternative energy resources in town. We have faced several barriers and difficulties during our developmental projects having been, to be and being implemented:

Placement of thermal water-gas utilizing small power plant:

In summer 2011 Municipality of Mórahalom started the Mórahalom St. Erzsébet Spa's B-40, and Hunyadi Park's B-45 thermal water wells' public procurement procedure within the frame of TREN/FP7EN/239515/ "GEOCOM" Concerto project directly sponsored by the EU's Committee of Energy. The procedure had to be cancelled due to the modification of law no. 2007/LXXXVI. about electricity, because during the pending public procurement procedure the modified law resulted in the reduction of compulsory takeover price concerning the connected heat energy and electricity generating power plants, furthermore, only domestic small power plants can be placed without authorisation procedure. The interpretation of law, the connected implementing rules and their practice are not obvious. Above these, the Government's Technical and Security Inspectorate and the Hungarian Energy Office do not interpret and use the legislation in force in the same way. The planned power plant's capacity to utilize the water-gas of Hunyadi Park's thermal well no. B-45 has passed 50 kVA. It made the matter even worse that the EDF DÉMÁSZ Ltd. prescribed the installation of a mid-voltage transformer to connect a power plant into system with the capacity of above 50 kVA, based on law on electricity generating no. 2007/LXXXVI § no.3/24. and the related decree about implementation no. 273/2007 (X.19.) § no. 5., paragraph no 2. All the mentioned above would have resulted the investment's loss.

Domestic size small power plant: a small power plant connected to a low voltage system, the connection capacity of which is not above 50 kVA on each connection point

Small power plant: power plant with power under 50MW

Promotion of electricity generating from waste and renewable energy resources:

According to the operative modification of law no. 2007/LXXXVI. about electricity, the utilization of renewable energy resources and waste as energy resource have to be promoted in order to save the environment and nature, supply users, save the elemental energy resources' usage and expand utilizable energy resources.



In order to facilitate the utilization of renewable energy resources and waste as energy resource, this law creates a differentiated, compulsory transfer system regarding to energy resources, production processes, efficiency of power plants, efficiency of energy conversion, and the installment date of the power plant. In the case of METÁR (Renewable Energy Production Takeover Price), it would be essential to spread it also to thermal water-gas besides biogas, biomass, and other renewable resources, since in several places the output thermal water contains methane, that is utilizable in connected heat and electricity producing systems. This way the payback time of geothermic energy developments is shorter, the utilization of energy resources and management of the national wealth could be made more efficient. The simplification of permitting procedure under 50kVA should be done, so all power plants should be licensed as domestic size power plants. Furthermore, the differentiated limitation of mining allowances, concerning thermal water and the connected water-gas would also be important.

Modification of mining allowance rules:

Mining allowance to be paid after thermal water-gas is: 12%, as well as in the case of natural gas, if the amount of annually produced natural gas is not more than 300 million m³.

At the same time, mining allowance do not have to be paid after the quantity of petroleum oil exploited by increased efficiency, environment protective procedures and the oil's accompanying natural gas.

In order to implement, Hungary has to act in the fast and efficient spread of geothermic energy during the facilitation of renewable and alternative energy resources, that has been taken in the EU's 2020 plans concerning its three times 20% objectives. It would be suggested to reduce mining allowances concerning the Mining Law's rules and keys about geothermic energy and the connected emerging gas. In the case of extracting thermal water without heat utilization, the allowance to be paid after the whole produced quantity is 2%, concernig the temperature difference between the draining water and 30⁰C; in the case of average efficiency of thermal water utilization, according to the current method (exploited temperature step), it's 2% concerning the difference between the temperatures of the well and 40⁰C, after the 50% of the produced quantity; in the case of thermal water utilization with high efficiency, it's 2% of the utilized temperature step (eg. from 60⁰C to 20⁰C) after the 25% of the whole produced quantity, and in the case of thermal water-gas utilization in connected heat utiliser power plants, it's increasingly 5-10% depending on the efficiency of utilization, after the produced gas's maximum of 25-40%.

Obligation to thermal water reinjection:

- The reinjection of cooled thermal water to the sandstone that arises after the warm thermal water's energetic utilization (buildings, green houses) is a well-service and energy intensive task based on hydrogeological and oil-industrial experience.
- Oil-industrial and hydrogeological experiences show that in case of sandstones, at least two reinjecting wells are needed for one producing well. In one hand, the reason for it is the wells' hydraulic resistance, on the other hand the colloid grains and solute settle down and condense in the reinjected water after a time, even when it is properly cleaned. The reason for it is partly the temperature difference between the water in the layer and the reinjected cooled thermal water, the falling rate of flow in the layer's grains, or the pressure difference between the layer and the injected water.



- In case of cracked and karst containers the rate of producer-reinjector wells turns back, this way one reinjecting well is enough for two producing wells, since the resistance of the reinjecting well equals zero in this type of container, only the system's resistance has to be defeated while pumping.
- In case of sandstones, the cost of well-service is significant, the cover of which from own resources may result in the lossmaking of thermal water's utilization. Before and after each season at least 1-1 layer treatment is needed with 2 superchargers, which cost 1-1,5 million HUF/occassion. It is relatively cheap, the chemical layer treatment is its plural. At the same time, during the intensive production of the reinjecting well, the water has to be led to the gutter, that is also led into a surface water-flow.
- During defining the water reinjection quota, not only water resource protective aspects should be taken into consideration, but the maintenance and service costs as well beside the hydrogeological conditions, since they can significantly lengthen the geothermic investments' payback period. In certain cases, it can cause the act's lossmaking, that may worsen competitiveness in the case of eg. agricultural utilization, or can reduce the opportunity to be in the market, which is a national interest, compared to farmers applying other heating resource.
- In the case of sandstones the obligation of reinjection should be reduced to 50% in current laws. The rest should be utilized balneologically where possible. It is important to make a difference between the containers in hydrogeological aspects, as they can be made of sandstone, can be cracked or karstic.
- If thermal water producers have payment obligation, they should spend these amounts on the service and reparation of their reinjecting wells.
- When paying water resource and mining allowances, the hydrogeological conditions, and in certain cases, the maintenance, service and reparation costs should also be taken into consideration. It may violate equality before the law, that certain thermal water producers can easily satisfy the obligation to reinjection, in favorable hydrogeological environment with low maintenance and service costs, this way they do not have to pay water resource allowance. At the same time, there are producers who are not so lucky and can only do it beside high costs due to their conditions, furthermore, they have to pay contributions, or even environmental fines. Certainly, it should be investigated, whether the thermal water producers do their activity carefully and competently, and they operate their wells in a way that those may keep their producing or reinjecting abilities in perspectives.

Sewage fine caused by run-off thermal water

The spas are soon going to face serious difficulties. This question has become the region's acute problem. Residents here mainly make a living on agriculture or spa maintenance, and they can only be competitive in firstlings production if they have the opportunity to use relatively cheap energy resources. Concerning spas, if a new charge is introduced, such as sewage fine caused by draining thermal water, this hardly profitable market may become impossible in certain regions. In the region (Szentés – Csongrád – Csanytelek – Kistelek – Balástya - Cserkeszölő), this cheap energy is thermal energy. The use of it often causes social stress, as the region's farmers work in a competing area. The transformed organisations of former large agricultural plants get extra cheap heat energy even beside paying the



MÓRAHALOM

MÓRAHALOM VÁROSI ÖNKORMÁNYZAT

increasing sewage fine caused by thermal water running off to surface water flows. It is also true for those cities, which started to use thermal heating before the rules for reinjection. These cities and the leading farmers are the front-line fighters of law modification proposals, so that the obligation for reinjection should be cancelled. The bringing off of this request is always taken on by the region's representatives, since it is connected with significant economic interest and number of workplaces. The leading agricultural enterprises and cities, the classic thermal water users do not make a great effort in this case, but as for other operative laws, concerning thermal water utilization, users have to take significant charges even without reinjecting obligation after 2012 and 2015. **If the rules do not change, this charge also has to be taken by spas that have been financed by the state in order to develop tourism, as a strategic sector.**

- The survey of the environmental damage caused by running off thermal water has been done at almost all users in 2003, after the decree no. 33/2000 was published, in order to get the water rights authorisation for operation. Actually, these surveys do not justify the necessity of reinjection. More than 15 great users have done risk audit. In the worst cases, the thermal water's salinity had an effect in the 5-10m area of drain pipes, and groundwater pollution could not be traced back to thermal water. In reality, thermal water drainage did not cause any environmental risk.

Fines concerning thermal water output are charged by Inspectorate of Water Management, Nature and Regional Environmental Protection. These fines and resolutions are different at each inspectorate, but the fact is:

These regulations are operative.

From the previous year, the authority in Szolnok has started the sewage fining (the starter fine is above 1 million HUF) of spas in case of having a higher Na content than the limit. Although it is true that the water's Na content is above 95% that flows from wells in the region.

Amounts to be paid:

Sewage fine: Counted on the basis of categories for water quality protection in different areas 28/2004 (XII.25.) and the limits for sewage drained into surface waters defined nationally.

Water load fee: It is to be paid to the Tax Authority (NAV) counted on the quantity below contamination limit, but there are opposite resolutions about the necessity of payment.

Continuously and permanently changing law context:

In the continuously changing law context, during the authorisation of geothermic energy usage, within the renewable and alternative energy resources, the applicant may feel himself on an obstacle course.

The authorisation procedure is complex, difficult to understand and long, during which laws may be modified even in 6 months periods, eg. Law on electricity. There isn't one permitting authority. In each case, there is an authority for the certain renewable energy utilization, and the other authorities are special authorities in the process (often as an adversary partner), that delays the licensing procedure. This way there are cases, where it is difficult to make a decision about the competent authority. There should only be one permitting authority to make the procedures more simple and faster.



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Legal certainty, equal rights:

Regulations and fines concerning thermal water output are controlled by regional Inspectorates for Water Management, Nature and Regional Environmental Protection, and often contradictory resolutions are made by them. The regionally competent EDF DÉMÁSZ Ltd. does not interpret the Law no. 2007/LXXXXVI. on electricity the same way as other service providers in the country, concerning domestic size small power plants and small power plants.

In favor of the above mentioned, there should be laws and implementing regulations which can be interpreted easily and applied anywhere by anybody.

The opportunity of access to renewable and alternative energy resources in the whole country has to be ensured to all residents with the same interpretation and conditions.

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