

SOCIAL ASPECTS OF IMPLEMENTING GEOTHERMAL PROJECTS IN GERMANY

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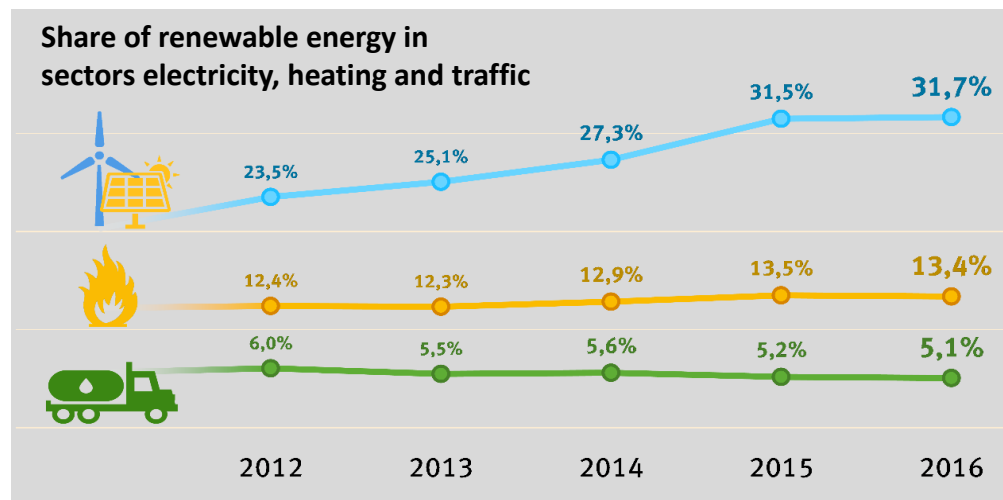
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ABSTRACT

SWM, energy supplier for the City of Munich, with a comprehensive plant portfolio for all forms of energy, has initiated energy transition from fossil co-generation to renewable resources. As geothermal energy plays a decisive role in SWM's "Vision 2040" for district heating and requires fundamental conviction of the supplier, SWM had to consider the implied social aspects: minimal impact on population and environment, high sustainability as well as economic benefit and social aspects. Taking all these aspects into account, geothermal projects should be successful and should help to improve people's quality of life. Munich and SWM are demonstrating that this way is feasible and even necessary especially for metropolitan areas, at least in Germany.

Improving environmental conditions

Contributing to CO₂ neutrality: SWM has decided in 2012 that future energy generation shall be implemented with the objective to supply the City of Munich with renewable energy and to realise CO₂ neutrality consequently. This decision implied a transition of fossil co-generation to a decarbonized production of energy. Whereas for German energy demand big efforts have been made in the sector of electrical generation the sectors of heat supply and traffic can be regarded as quite unchanged in terms of percentage of renewables.



(1)

As a first step in the masterplan for future electricity generation SWM is able to provide CO₂ neutral electricity for all households and traffic in Munich since 2015. But Munich's challenge is currently another: population of Munich has voted in 2017 to shutdown a coal fired CHP plant until 2023. This capacity has to be substituted not only electrically but also concerning the thermal supply into the grid of district heating. The will of the City of Munich, to accelerate CO₂ goals, is reflected in SWM's "Vision 2040", in which geothermal energy shall play the decisive role in the transition to heating from renewable resources.

No emission of pollutants: Additionally geothermal energy generation can be realized within the city area without pollutant emission. Thus a local reduction of emission compared to the former use of combustion plants can be achieved. Population acknowledges that this means an improvement of life quality and health conditions.

Reaching acceptance and identification

Geothermal projects in Munich currently enjoy a quite high acceptance level. How could this be reached and will it be reached in future?



(2a) Current geothermal project "Schäftlarnstraße" (SWM)

Four important items are generally relevant:

Costs for avoiding CO₂-emission: Not only the fact that geothermal energy can be regarded as a zero emission – resource is crucial. Economics are as well quite an important acceptance factor as the costs are directly charged on the annual account of the consumers. When evaluating all available energy resources and options SWM came to the conclusion that geothermal energy will imply the lowest costs realizing CO₂-reduction and decarbonisation in the heating sector and that geothermal heat does not require more expenses than other resources.

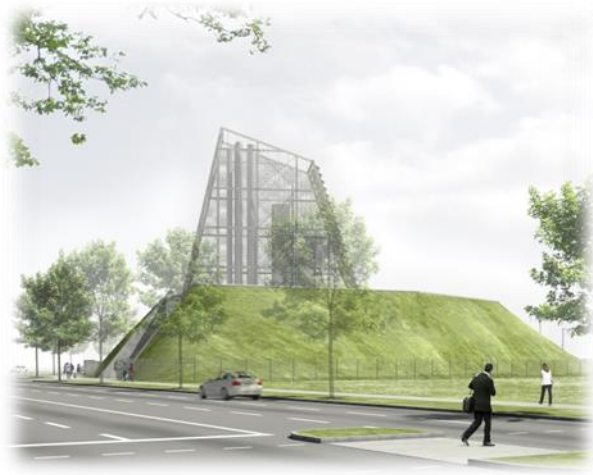
Noise emission: as geothermal heat plants produce no noise emission and geothermal power plants can reduce them significantly below noise limits, they can be integrated in urban development plans. Munich has demonstrated for example that 24 hour drilling and operation is possible within the city.

Transparency: In the forefront of geothermal projects SWM tries to involve publicity and authorities in the preparation and the concept of a project. E.g., the performance of the 3D-seismic campaign was realised with high priority of explanation and demonstration. It has been proved that better understanding and , moreover, later identification have been achieved. Other examples are the early participation in local commissions as well as presentations and discussions already in schools and universities.

Research: As geothermal projects in a bigger scale can be regarded as quite innovative in Germany, SWM has realised several government-funded research proposals to come to a better understanding of geological conditions and later operation. These fundamental and comprehensive research projects have been performed successfully so that the results give additional value to the population. Taxes have been invested responsibly.

Geothermal as integral part of urban development

Munich as a city with currently positive employment opportunities is attracting especially young families and experienced employees. Although not comparable to the growth of Asian metropolitan cities Munich has also to increase the number of apartments rapidly. In consequence building structure in the centre will be compacted and new suburbs have to be developed. The integration into the given structure of Munich is ensured by regulatory requirements on the one hand. Besides the City of Munich took “energy-related, urban design and socio-economic considerations” into account. These planning conditions comprised geothermal drillings and well as geothermal plants. Both were integral components when developing for example the new district “Freiham”, west of the city centre.



(2b) Draft geothermal project “Freiham”



The geothermal plant Freiamt is in operation since 2016. While the development of the new district is still in progress, the plant already supplies heat into the grid of Munich until the demand of the new buildings and inhabitants has reached its maximum.

Referring to the planning, the establishment of district heating can be the key for new urban areas. Accompanied by new standards (e.g. optimization of thermal insulation, reduction of the supply temperature) and innovative implemented infrastructural measures it contributes not only to CO₂-objectives but benefits additionally the social system. As currently about 50% of the world population is living in metropolitan areas this means a huge potential in both respects. (3)

Last but not least the intention of SWM corresponds to the objectives of the City of Munich (4): “In line with the integrated approach, these plans have been harmonised and combined to form a comprehensive energy roadmap covering the following key issues:

- identification of criteria to assess the importance of different courses of action within the scheme of an integrated approach towards sustainable and energy-efficient urban development
- determination of carbon savings potential applicable to the new development and existing areas
- linkage of urban design, local heat supply and energy standards
- local acceptability and economic implementation of high energy standards
- prevention of social polarisation between existing and new districts.”

CONCLUSIONS

Although also difficulties can occur during geothermal project implementation, the advantages of the concept “Vision 2040” of SWM are predominant, because a holistic approach is targeted: this means focusing not only on technical aspects but also involving the concerns of the community and neighbours. The example of SWM and the City of Munich demonstrates that geothermal energy can be regarded as an appropriate energy resource to fulfil social expectations of future energy generation.

REFERENCES

- (1) Umweltbundesamt Berlin
- (2) Project documentation SWM
- (3) Wuppertal Institut für Klima, Umwelt, Energie GmbH und SIEMENS AG: "Sustainable Urban Infrastructure: München - Wege in eine CO₂-freie Zukunft" (2009)
- (4) Landeshauptstadt München, Referat für Stadtplanung und Bauordnung (2012): Sustainable and energy-efficient urban development in Munich