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GEOTHERMALS

The energy within

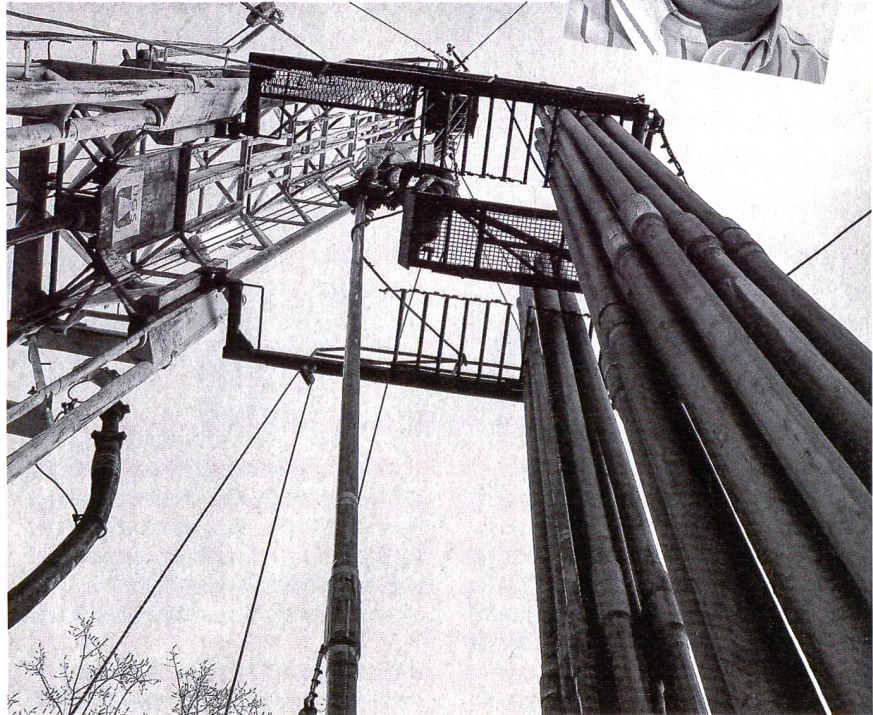
Markus
O. Häring

An indigenous new source of energy is to be utilised in Basle

In Basle the depth reading is "2755 metres". This is the depth reached by the exploratory drill of the Deep Heat Mining (DHM) project. This is an ambitious project in the area of deep geothermals, which began in 1996 in Otterbach/Kleinhüningen, the port of Basle. The objective: environmentally friendly use of the earth's heat by converting it into thermal and electrical energy in a geothermal power plant on the surface. "With some optimism, operations could start at the end of 2009," says Markus O. Häring, the manager of the Basle project and director of the Swiss company Geothermal Explorers Ltd., based in Steinmaur.

Conditions. The principle of DHM or "hot, fissured rock" consists of setting up a heat exchanger at great depth in firm, deliberately fissured rock. In Basle, the borehole should reach a depth of 5000 metres. Cold water is injected under high pressure and conveyed to a point at which the rock is at temperatures of about 200°C. The water pressure opens up the existing fissures in the rock. The water circulates in the reservoir which is created, is heated up and brought back through one or more boreholes, termed production boreholes. The water has to be kept under pressure so it does not vaporise at such high temperatures. Back on the surface its heat content is delivered to a second circuit and converted to electricity and process heat in the geothermal power plant using a steam turbine and a generator. Thus houses in the locality can be supplied with both power and heat.

"The characteristics of the granite which occurs here are excellent," enthuses Markus O. Häring. He adds: "The quality of the rock is not the only condition for a project of this size. In the present case, an existing district heating plant and the political will which was present probably played an even more important role". The company *Industrielle Werke Basel* have the necessary network and the government of the canton of Basle City is prioritising environment-friendly energy supply projects. In August 2003 the cantonal executive approved the DHM project and proposed an investment loan of CHF 40 million (€ 26 million). This is supported unanimously by the energy commission of the cantonal parliament and will be voted on in the June 2004 session. The amount corresponds to half of the total investment of CHF 80 million. The other half of the budget is de-



The Basle deep-drilling rig

voted to the construction of the geothermal power plant and the completion of the distribution network.

"At the drill head we are expecting 30 MW thermal," states Markus O. Häring. Energy production on the surface will be 20 MW thermal and 4 MW electrical, so it will be possible to supply 5000 households in the Basle region with heat and power. "We will need about 1 MW of electricity to operate the system, so we will be able to feed 3 MW into the grid," calculates the project manager.

Prospects. The next steps involve sinking three boreholes to a depth of 5000 metres. "As soon as the loans are agreed, we shall begin to drill the first deep borehole." The Director of Geothermal Explorers Ltd. expects this borehole to be ready in January 2005 "with a bit of luck" and in operation by early 2007. The Basle project has unfortunately been somewhat delayed due to the lack of support from the Confederation. Parliament has not yet dealt with a parliamentary proposal for the promotion of geothermal heat and power generation, even though this is an indigenous, clean, virtually inexhaustible source of energy, which is independent of the time of day, the seasons and the weather. It can be regulated according to demand, needs little space and has hardly any environmental impact. An annual reduction in CO₂

output of 40,000 tonnes is in prospect for Switzerland.

In the medium term, the world's dependence on fossil fuels and nuclear energy could be considerably reduced. Switzerland could export an advanced technology and high-grade know-how. Europe is already committing itself to deep geothermals with the construction of the plant at Soultz-sous-Forêts in Alsace, which will come onstream in the course of 2004. "After Basle, we are hoping to implement a whole series of projects; Geneva has already expressed its interest and designated a site," announces François-David Vuataz, geothermals project manager and senior assistant at the University of Neuenburg, vice-president of the Swiss Union for Geothermals and member of the DHM Consortium project committee.

The first deep geothermal project in Basle will produce primarily thermal energy, "which will allow us to demonstrate its feasibility". In the future, however, the focus will be on electricity production, "thereby eliminating the distribution problems associated with the locality," stresses Markus O. Häring, who refers to numerous utility providers and cities which are interested in DHM.